# Vietnam War Booby Traps

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# CONTENTS


INTRODUCTION 4

NON-MECHANICAL BOOBY TRAPS 7

MECHANICAL OR NON-EXPLOSIVE BOOBY TRAPS 10

HAND GRENADES AS BOOBY TRAPS 17

EXPLOSIVE BOOBY TRAPS AND MINES 22

THE MILITARY USE OF BOOBY TRAPS 36

Searching for booby traps

Detection techniques

Mine detectors

Road clearing

Manual disarming

Casualties

FREE WORLD FORCES' MINES AND BOOBY TRAPS 55

Installation defense

Claymore mines

US antipersonnel mines

CONCLUSION 62

BIBLIOGRAPHY 63

INDEX 64

# VIETNAM WAR BOOBY TRAPS

## INTRODUCTION

The Vietnam War (November 1, 1955–April 30, 1975) was the first conflict in which booby traps played a significant role causing noteworthy casualties. While booby traps have been employed by all sides in most previous wars, their use was rather limited, even in World War II. This was due to increased espionage, sabotage, and guerrilla warfare, plus the availability of effective multi-functional firing devices.

It was the nature of the war in Vietnam that brought booby traps into prominence. The VC (Viet Cong) fought a shadowy guerrilla war against a much stronger enemy, the Free World forces: US, ARVN, South Korean, and Australian/New Zealand forces were superior in strength, firepower, mobility, logistics, and command and control. The VC were unable in most instances to hold their own in standup fights against such opponents. Instead they relied on traditional guerrilla warfare tactics of small-scale hit-and-run attacks, ambushes, terrorist actions, and precision attacks against bases where they temporarily controlled the surrounding area. They chose when and where to attack, and employed the means of attack that allowed them to avoid direct contact with a superior enemy. These included long-range stand-off attacks with rockets, mortars, and recoilless rifles, mining road systems Free World forces relied on for supplies, attacking water traffic and helicopters, and one of the oldest guerrilla weapons, booby traps. Contrary to popular conception, the endless jungles, swamps, paddies, and mountains of Vietnam were not liberally sown with booby traps. Their positioning was typically precise and well thought out. There were no randomly scattered booby traps without a purpose.

For the VC, booby traps were ideal weapons and the perfect means of conducting low-profile attacks. Large numbers could be made in village workshops and jungle factories using locally available materials as well as modern munitions. Munitions were obtained from Communist China and the USSR sent down the Ho Chi Minh Trail as well as from within South Vietnam. This latter source of material consisted mostly of American munitions obtained through the black market, pilfered from arriving supplies, sold or contributed to the VC, and items captured or recovered on the battlefield. Despite frequent cautioning, this was one of the main sources of supplies. The VC detailed teams who trailed Free World units and recovered lost and discarded munitions and materials along their route, and from overnight bivouacs. These materials included ammunition

**OPPOSITE**
Members of an understrength squad of 2d Battalion, 4th Marines pass through a punji stake-studded drainage canal. Their body armor vests ("flak vests") were more effective against booby-trap detonations and other fragmentation than against small-arms fire. (DEFENSE DEPT PHOTO (MARINE CORPS) A186718/Wikimedia/Public Domain)

cans, boxes, and tubes; "pop-up" flare tubes, tank gun, and howitzer cartridge cases, later made into pipe bombs; C-ration cans, used radio and flashlight batteries (which retained sufficient charge to set off a blasting cap), tripwire materials, Claymore mine accessories, etc. Even cartridge cases and burned-out smoke-grenade canisters were reusable along with their expended fuzes. Recovered dud munitions, including mortar shells, artillery projectiles, aerial bombs, and small cluster bomblets, were adapted as mines and booby traps, or their explosive fillers removed and used in homemade munitions.

The Vietnamese are artistically creative and ingenious. Country peasants were raised in the village tradition of relying on locally available materials along with discarded modern implements that came their way. They were well acquainted with working with wood, bamboo, vines, and other natural materials. Bamboo especially was a key component of many booby traps, especially the infamous punji stakes. Retail shops in cities and large towns provided hardware, electrical materials, and tools.

Most booby traps and command-detonated mines were made and emplaced by the VC. The more conventional PAVN made only limited use of such means. They were used to protect PAVN camps and bases, but even those were largely emplaced by local VC units hosting the transient PAVN.

Not only were they adept at building booby traps from any available materials, they had an eye for their natural surroundings. They could make booby traps "invisible" in the jungle, plains, mountains, swamps, villages, and urban areas. They not only did a superior job of hiding booby traps and their means of triggering, but also situating them in places and surroundings often unexpected by Free World forces.

Essentially there were three broad types of booby traps: non-mechanical, mechanical or non-explosive, and explosive. Explosives could be triggered unintentionally or command-detonated causing damage with blast, fragmentation, or incendiary action. Mechanical booby traps contain no explosives or incendiary materials, relying instead on spikes, weighted objects, falls, or other means causing impact and puncture wounds. Non-mechanical booby traps, such as fixed spikes or the famous punji stake pit, are fixed and have no moving components.

Booby traps could be crudely simple or startlingly complex and ingenious, ranging from pointed sticks to electrically command-detonated mines. Besides a wide variety of booby traps, the VC/PAVN also used land and water mines, both contact/pressure-detonated and command-detonated. In fact, they were using command-detonated mines along roads and waterways long before the IED (Improvised Explosive Device) term came into use in Iraq and Afghanistan in the 2000s.

The use, types, triggering means, camouflage, distribution, and other factors involving booby traps were constantly changing and required Free World forces to be persistently on guard and tensely alert. When a unit deployed to a new operational area its members would encounter entirely different booby traps than they had previously experienced. There was little second-guessing the ingenious enemy. Free World forces published a great many manuals, lessons-learned reports, and studies on VC/PAVN booby traps and mines to keep pace with the continuous changes and new innovations. Arriving troops undertook a two-week orientation and acclimatization course before deploying to the field, which included booby-trap detection and identification training, and how to respond to them.

# NON-MECHANICAL BOOBY TRAPS

Essentially, non-mechanical booby traps have no moving parts, are simple to construct and emplace, and are basically "hide and forget" devices. They will of course eventually deteriorate. The most common incorporated punji stakes emplaced in countless manners. Often, they were simply stuck in the ground at slight angles to cover the front of berms, the inside of ditches and moats, hidden among vegetation bordering ambush kill zones, and on LZs or inside the tree line. An example of the latter in action involved a helicopter-inserted rifle company running into such stakes on an LZ's edge and two insertion choppers having to return to extract six injured men – and not a shot was fired.

Bamboo (*tre* or *cây tre*) was a key material extensively used to construct all manner of buildings, houses, footbridges, fences, scaffolding, and other structures, as well as furniture, accessories, tools, utensils, and booby traps. It was plentiful, growing in broad swaths of land throughout Vietnam, and is easy to work with, including cutting, splitting, and sharpening using machetes, hatchets, and carving knives. Stakes can be shaved to a needle-sharp point, which is quite tough, and it is unnecessary to char-harden them.

Every few inches, bamboo stalks (culms) form a tissue joint – a node – the rigid membrane between hollow segments of a culm. The nodes separate the hollow compartmented segments. The joint ridges formed by the node reinforce split bamboo. The tissue joints could be punched out with a sharpened stick to create a "pipe." Bamboo, a member of the grass family, grows quickly and has a higher specific compressive strength than wood, brick, or concrete, and its specific tensile strength rivals that of steel. Freshly cut, it is green, but dries to a camouflaging tan or light brown in 6–12 weeks.

The well-known **punji stake pit** took many forms, but typically measured 12×12in (size varied) and were 12in or more deep. The basic pit simply had a number of stakes driven into the bottom. Spikes and nails driven into boards were also set in pits – they could not be simply pulled out of the foot like stakes in the ground, but had to be removed from the pit still impaled in the victim's foot. Another method was to drive additional stakes in the pit's sides. They could be angled either upward, to impale the calf and ankle as

Bamboo punji stakes. The larger stake at left has had both ends sharpened, the shorter end being driven into the ground. The stepped notch was used to hammer it into the ground. The two small ones show opposite sides: in the center is the convex (exterior) and at right the concave (interior). This arched cross-section gave the bamboo stakes their strength.. It can be seen just how sharply pointed the stakes could be made by shaving them. (Author)

### Where did punji stakes originate?

The term "punji stakes" originated in the Punjab region of northwest India, but the concept is of even more ancient origin. The use of embedded sharpened stakes occurred the world over during prehistory, though when and where exactly is lost in antiquity. The British first encountered them in the 1870s border conflicts with the Kachins during the various Anglo-Burmese wars. The modern use of punji stakes appeared in a British intelligence report in 1944 suggesting they could be used for defenses, in conjunction with ambushes, and as harassing measures in Burma. They had been used against Commonwealth forces by the Japanese in Malaya and Burma, and the report was reprinted in a US publication, Intelligence Bulletin, in the October 1944 issue (War Department 1944b). These traps eventually appeared in US Army Special Forces manuals in the 1950s and many were subsequently used by the VC. The South Vietnamese and French also used them early in the conflict to defend camps and villages as a substitute for barbed wire, at that time in scarce supply.

This rectangular punji stake pit had several small pieces of boards with numerous nails driven through them. When it was stepped on and the foot was reflexively withdrawn, the small nail boards would remain impaled. (Tom Laemlein/Armor Plate Press)

the foot plunged into the pit, or they could be angled downward, making the foot extremely difficult to extract. The stakes had to be dug out to extract the foot. The hole might be reveted with slats, cardboard, or bricks to prevent collapsing when the ground was saturated. Pits were easily concealed with lattice-like covers of sticks, twigs, and leaves. When a pit was located the stakes were pulled out, broken, and the pits backfilled. Another method was simply to drop in a grenade.

Even more difficult to detect were stakes planted in streams or deep slushy mud on trails. The stakes were either set in concrete slabs or driven through boards with rocks wired to them as anchors. They could sink into mud, be washed away, or turned over by racing storm waters.

Punji stakes varied greatly in length, stake size, material, and basic design. They were most commonly made of split bamboo, e.g. a 1in-diameter length of bamboo split into four stakes. A 0.75in-diameter stalk could be left intact and not slit, just sharpened on both ends and shoved into the ground. They might be char-hardened, but it is now theorized that ancient humans' spears and other pointed weapons were fire-charred to evaporate moisture and charring the wood made it faster and easier to scrape-sharpen. Too much charring weakened the bamboo culms as they are comprised of fibrous cellulose and the fine fibers were weakened or became too brittle.

Split bamboo stakes could vary in length – 1–3ft – depending on purpose and placement. A typical stake was sharpened at both ends, the upper ("business") end tapering to a point for about two-thirds its length. The bottom end was tapered to a point about one-third its length. A notch might be cut near the two-thirds-length portion. This allowed it to be hammered into the ground. Barbs were seldom notched near the point. Stakes incorporated into mechanical booby traps were very differently designed.

Punji stakes were also made of hardwood sticks. Large nails and simple hand-forged metal spikes were used, sometimes with hammered barbed points. Any suitable scrap-metal pieces, thick stiff wire, or welding rods with the ends cut to an angled point could be worked into spikes. They were also nailed through boards or set in drilled holes, especially steel spikes. Sometimes spoiled meat or excrement was smeared on stakes to cause infection. A man impaled through the foot with barbed spikes had to be evacuated and major surgery undertaken to remove the impalement, often involving the foot's loss.

Most stakes were made by villagers for the VC as a form of "war tax," with assigned quotas. Once produced, they were packed in bundles secured by vines. Special Forces camps and South Vietnamese security forces defending villages also made use of stakes made by villagers, but they were paid for their work.

Punji stakes were of course simplistic traps, but the author's company found an abandoned ambush site incorporating punji stakes into an effective, albeit unexecuted, ambush plan. At a trail crossing a stream that was east–west-flowing, 10ft wide and 2ft deep, CIDG strikers established security while members of the company crossed and filled canteens in a partly overgrown clearing. To the east of the trail on the stream's south side the strikers discovered an area of low brush some 30ft from the trail. It contained scores of 2ft bamboo punji stakes angled toward the trail, stretching from the stream bank for about 100ft in a 15–20ft-deep band parallel to the trail. The interval between stakes varied (1.5–3ft). On the west (opposite) side of the trail, some 50ft from it, was a well-concealed machine-gun bunker covering the ford and most of the trail facing the punji-staked area. A line of seven one-man foxholes ran north from the bunker. The bunker and foxholes, first checked for booby traps, were hidden among dense brush and trees. Camouflage had deteriorated and the bunker and foxholes were half-filled with water. The brush had grown since the site was established. A campsite was found some distance behind the bunker and foxholes. The intent was to open fire on troops collecting at the ford as they filled canteens and milled about. Most would have fled into the punji-stake field. It was never executed, however, and the strikers uprooted and broke most of the stakes and collapsed the bunker's rotting roof beams.

The **crow's foot** was a four-pronged metal device, designed so that one of the usually barbed spikes would always point up when dropped on the ground. The size varied between 2in and 12in. They were derived from the medieval caltrops thrown before advancing infantry and cavalry. The crow's foot was employed against both personnel and rubber-tired vehicles.

A poor view of a typical punji stake pit, revealing a number of bamboo stakes concealed by a woven mat over which leafy vines have been placed. The dead vines called attention to the trap. Besides the threat posed by the stakes, such a trap could inflict a sprained or broken ankle. (Tom Laemlein/ Armor Plate Press)

An M14-armed US rifleman passes a partly camouflaged mantrap. Such large pit traps with punji stakes in the bottom were scarce owing to the labor time required to build them, the effort needed to haul off the quantity of dirt, and the difficulty involved in effectively camouflaging them and blending them into the surrounding ground. (Tom Laemlein/Armor Plate Press)

# MECHANICAL OR NON-EXPLOSIVE BOOBY TRAPS

Mechanical booby traps lacked explosives and functioned in a wide variety of manners, mostly simplistic and easily fabricated using local materials. The more complex and the more moving parts, the sooner they would deteriorate and become non-functional after exposure to temperature changes and rain. They could be neutralized by disconnecting the triggering device and simple manual disassembly, pulling them apart, removing spikes, or wrecking them with a machete or e-tool. Rope, cord, wire, and steel components such as forged barbed stakes were removed.

The VC employed numerous effective non-explosive booby traps as paraphrased in the 1969 publication *Viet Cong, Boobytraps, Mines, and Mine Warfare Techniques* (TC 5-31). These devices were easily constructed from local materials. Most of these were relatively scarce, but in some areas they would be numerous and, of course, there were variations. See page 13 for illustrations of most of these traps.

The **barbed spike plate** consisted of metal spikes of varied design fastened to a wooden board. The simplest form of spike plate was nails driven through a board; the nails might be sharpened or barbed. Metal rods might also have been fastened to boards and either filed to a point or barbed. These small

A simple tripwire-activated crossbow set up to fire down a trail at torso level. If the bolt (arrow) struck web gear or equipment it would seldom penetrate. It required significant skill, patience, and time to fabricate and set up a crossbow booby trap. It required care when camouflaging it to effectively hide it and not hamper its functioning. (Tom Laemlein/ Armor Plate Press)

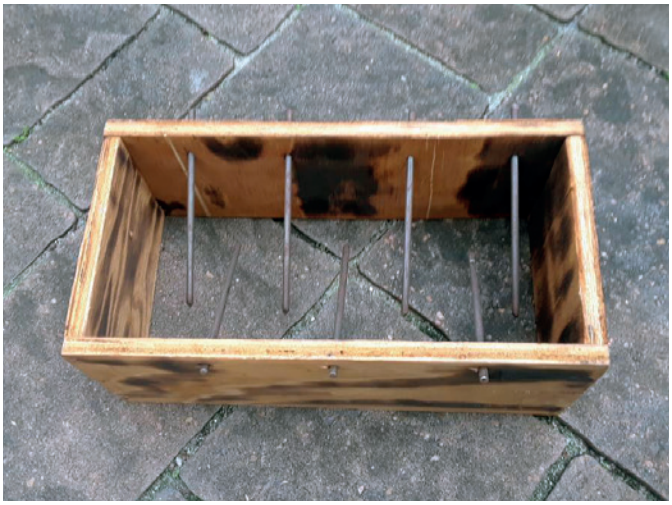
spike boards may be employed a few at a time or in large quantities to impede the movement of troops. They were normally placed on the ground but could also be placed in holes. In any case, they were difficult to detect in the dense grass and undergrowth.

A variation of this technique combined barbed stakes with a pressure-release explosive booby trap. Punji stakes were embedded in concrete or a heavy block and placed in a camouflaged hole. A pressure fuze was attached to a grenade or demolition charge and placed under the block holding the punji spikes. Should an injured man or the block itself be removed, the pressure-release fuze detonated the grenade or charge.

The **bamboo whip** consisted of a length of green bamboo typically 6ft 7in long, with bamboo spikes on its end. The bamboo pole was bent and held in an arced position by a catch device with a tripwire across a trail. When the tripwire was tripped the catch device was released and the spiked end of the pole struck the man with great force at chest height. A variation of the whip utilized three or four barbed-point bamboo arrows rather than spikes. The release of the catch device launched the arrows at the victims. The whip's pole, however, soon lost its "spring."

The **angled arrow trap** fired a steel arrow through a 3ft-long bamboo "barrel," propelled by a strong

These former French spring-type bear and hog traps were discovered around a pro-VC village. Such traps had a short length of chain to anchor them to stakes. They could break an ankle; lacking a leather upper reduced the protection afforded by canvas-topped jungle boots. The traps are rusted, but that helped blend them into camouflaging materials. They could also be hidden in high grass and brush. (Tom Laemlein/Armor Plate Press)



A mockup "Venus flytrap" used for instructional purposes, courtesy of Trey Moore. It would be buried in a pit and camouflaged. When it was stepped into, the steel prongs flexed, allowing the foot to descend and the spikes to tear into the angle or calf, trapping it. The entire trap would have to be dug up and the casualty evacuated still clamped in the trap. (Author)

inner-tube rubber band. The barrel was mounted on a wooden board with nails and wire. A catch mechanism held the rubber band and arrow in a cocked position in the barrel until the booby trap was activated by a tripwire. The trap was placed in a slanted camouflaged pit.

**Bear traps** were the larger old-style single- and double-spring animal traps, introduced by the French for trapping tigers, wild boars, and other large animals. The trap was laid flat on the ground and held cocked by a heavy spring(s). When a man stepped on the trap's trigger the jaws snapped closed, gripping the man's ankle.

The **pivoted spike board** consisted of a lever pivoting between a treadle on one end and a spike board on the other. The treadle was placed over a pit. As the victim stepped on the treadle, the lever rotated about its axle and the spike board swung upward to smash into the stumbling victim's torso or face. A smaller variation was arranged to inflict wounds on the victim's legs.

The **Venus flytrap** consisted of a rectangular framework with overlapping barbs emplaced over a pit on trails or hidden on rice paddy dikes. The flexible barbs, bamboo or metal, were angled downward in the pit. When the trap was stepped into the barbs flexed, jamming into the foot or ankle and making extraction of the leg almost impossible. A variation used a square or round metal container such as a 5-gallon lubricant can (11.5×13.5in) with barbed spikes protruding into and downward from the top edge.

The **sideways-closing trap** consisted of two wooden jaws studded with spikes, which snapped together along a pair of wooden guide rods. The trap was powered by two large rubber bands cut from inner tubes. A wooden prop kept the jaws apart and the rubber bands in tension. The frame was placed atop a pit up to 4ft deep and camouflaged. As a man stepped on the

**A**

**VC MECHANICAL OR NON-EXPLOSIVE BOOBY TRAPS**

See main text for additional details. Variations of these were endless. In these illustrations, camouflage is omitted so details can be seen. The use of camouflaging materials had to be carefully arranged to prevent it from hampering the booby traps' functioning.

The bamboo whip (**1**) was seldom seen, being delicate and temperamental to set up. The one depicted here is set at ankle height, but they could be set up to chest height.

The angled arrow trap (**2**), here mounted in a ramped trench, could also be set above ground attached to a bamboo framework hidden in brush and aimed down a trail or inside a darkened hooch directed at the door.

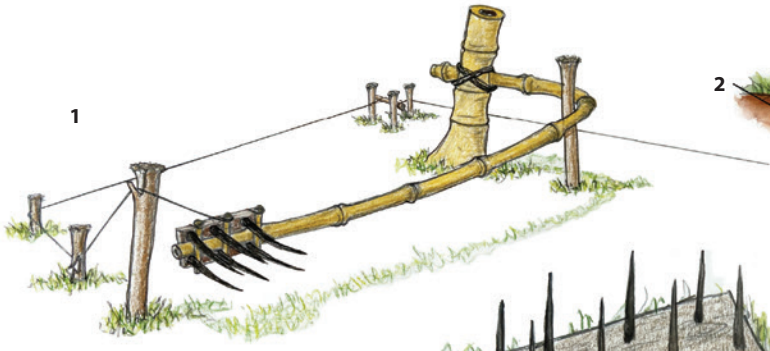
The lower portion, the treadle board, of the pivoted spike board (**3**) was located over a deeper pit. When it was stepped on it was pushed into the pit to pivot the spike board into the victim's torso.

The "Venus flytrap" (**4**) was so named for its appearance rather than its function. When stepped into, the trap allowed the semi-flexible spikes to bend downward and rip into the leg. It was extremely difficult to extract the leg snared by multiple spikes.

The sideways-closing trap (**5**) had a fragile fixed spreader bar that broke when stepped on and the two rubber bands, cut from an inner tube, snapped the two spiked bars closed.

The trap bridge (**6**) was adapted to fit the many different styles of peasant-built bridges using local materials. Besides being designed to break or collapse, they might be rigged with booby-trapped grenades or mortar rounds. Here, the sawed break in the log is camouflaged with mud and barely held together by a few nails.

The suspended spikes device (**7**) was weighted by rocks or bricks and suspended in a tree to drop on a passing soldier or Marine who tripped the tripwire across a path. A simple bundle of rocks or bricks, or a short heavy log studded with spikes, could also be used.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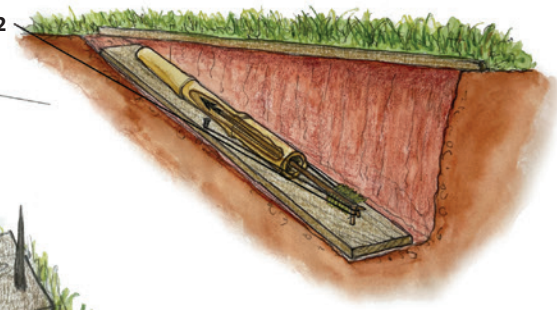
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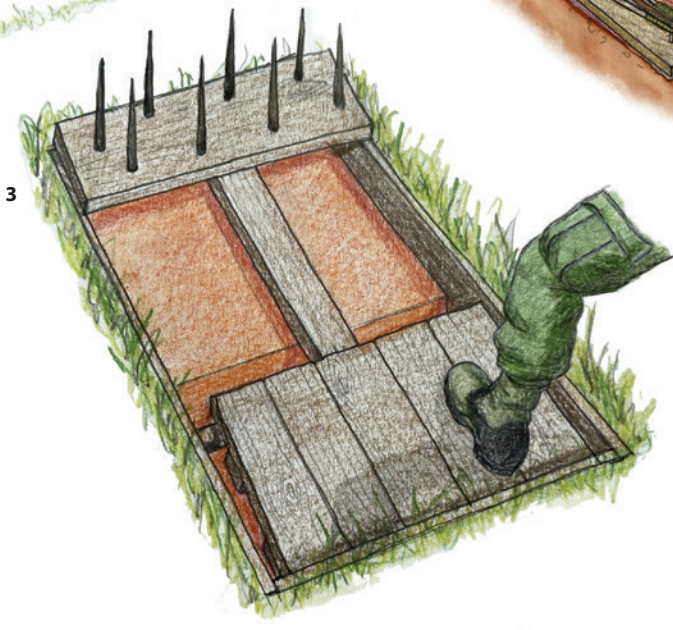
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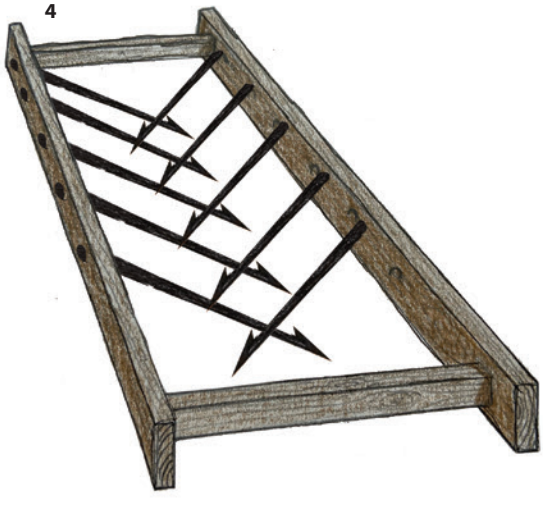
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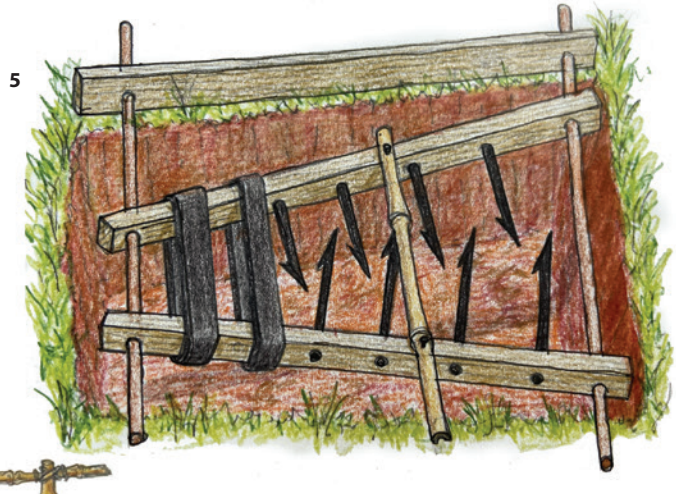
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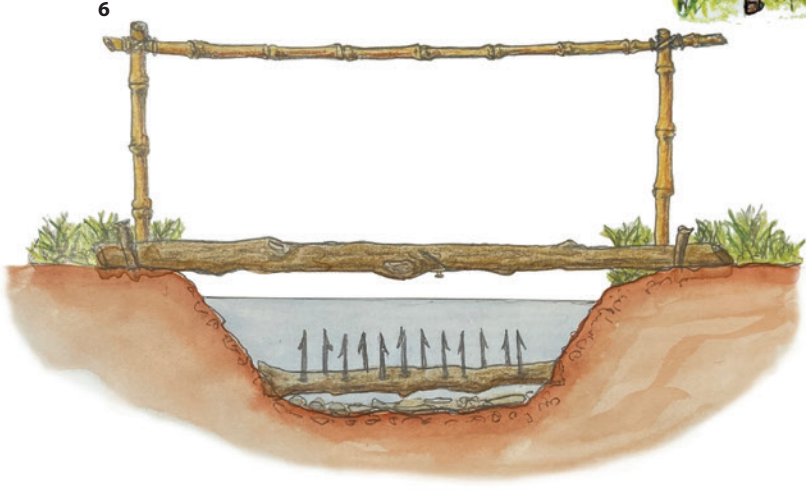
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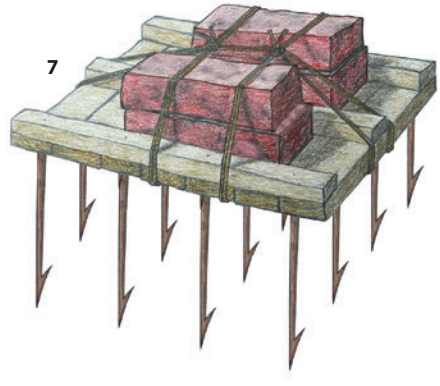
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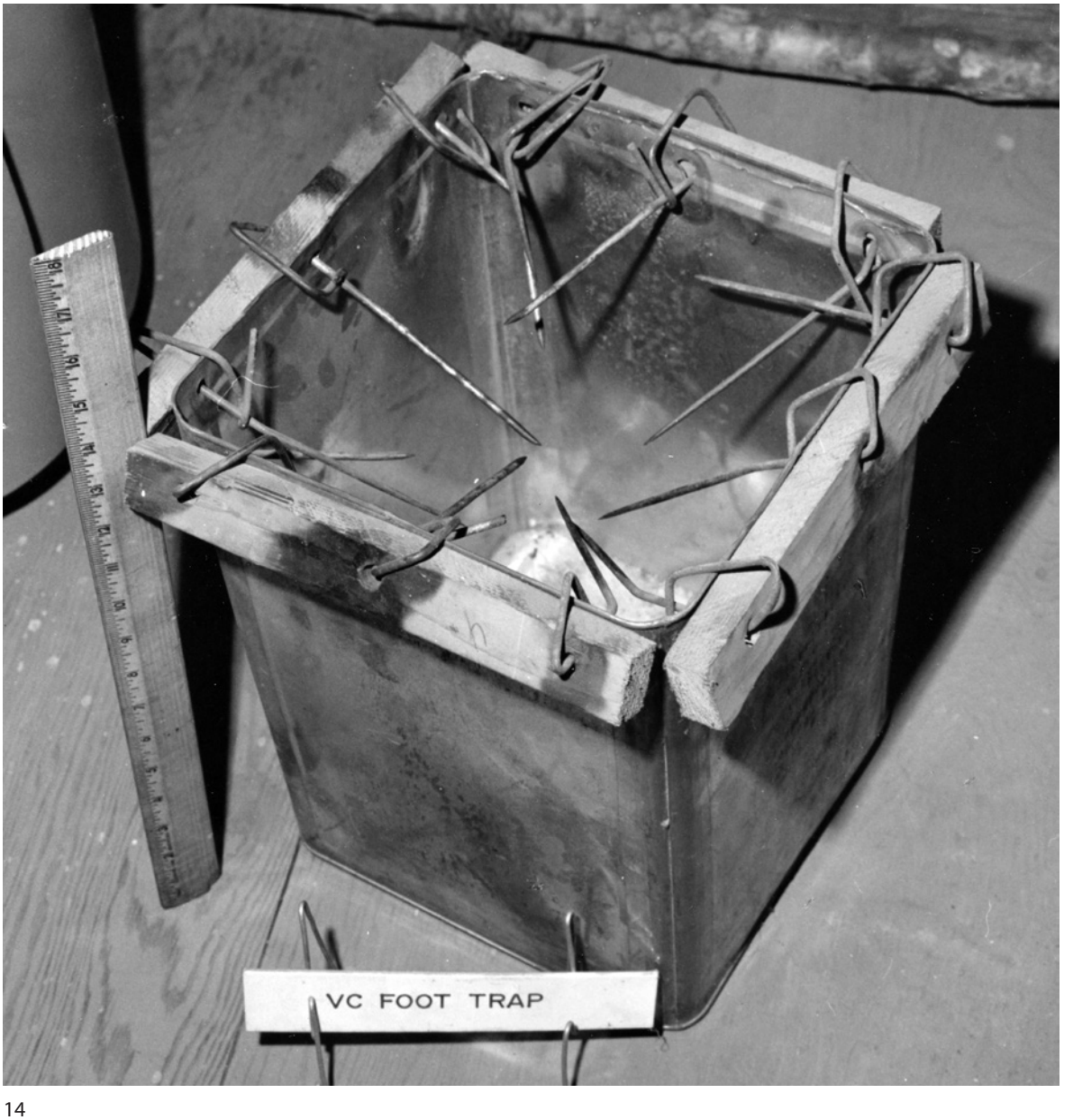
This 5-gallon rectangular tin can has three downward-angled steel spikes fastened to wooden slats. The spikes' retaining loops were fabricated using common pliers. Like the "Venus flytrap" it would impale and trap the victim and would have to be dug out of the ground. (Tom Laemlein/Armor Plate Press)

device he broke the prop and fell into the pit. The rubber bands snapped the spiked jaws together, clamping around his leg, the abdomen, or chest if deep enough.

In Vietnam, foot bridges spanning irrigation and drainage ditches and streams typically consisted of a bank-to-bank foot-log, several inches in diameter, propped up by stout Y- and X-shaped support poles with a bamboo or limb handrail. The **trap bridge** was a small wooden foot bridge booby-trapped by partially cutting the deck or support log and camouflaging the cut with mud. Punji stakes were placed underwater beneath the bridge and perhaps along the banks. Anyone crossing the bridge caused it to collapse and was impaled on the spikes. Occasionally the ditch was dammed downstream to retain water and cover the spikes. If the ditch was not dammed, the spikes were driven in level with the mud or camouflaged with trash and vegetation debris.



A pivoting spiked mantrap emplaced over a door was difficult to make out inside a darkened hooch interior. Activated by a tripwire, it would swing downward and slam into the entering soldier anywhere from his belly to his face. These could also be rigged in bunker and cave entrances. (Tom Laemlein/Armor Plate Press)

The traps shown here and opposite consisted of two end-to-end boards over a hole and supported on horizontal sticks. If stepped on in the split center, the foot would plunge into the hole and the boards catapulted upward to impale the calf. If missing the center, the victim might instead step on the nails/spikes driven through near the boards' ends. (Tom Laemlein/Armor Plate Press)

There were wide variations of what were known as the **mace** or **spiked log or ball**. These consisted of a ball or log studded with bamboo or metal spikes, which were suspended in a tree, hidden in the limbs, to fall or swing into a victim when the tripwire was tripped. Studded with spikes, the mud (oven-baked), brick mortar, or concrete balls could be 1–2ft in diameter. The log could be 8–12in in diameter and 3–10ft long. The large log without spikes was devastating in its own right. Logs were usually aligned with the trail axis, but for wider tracks or one-lane roads the swinging log might be rigged road-width. The mace was devastating, offering a combination of brute-force impact and penetrating ripping spikes.

The **suspended spikes device**, aka tiger trap, consisted of a square board or frame, approximately 18×18in (or other sizes), with spikes protruding downward. It was weighted with bricks or rocks and suspended from an overhead tree branch above a trail. A tripwire across the trail was tripped beneath the spike board, releasing the device to fall on a passing soldier. The steel helmet offered little protection from impact.

# HAND GRENADES AS BOOBY TRAPS

Owing to their design, size, and activation, grenades were often easily adapted to booby traps. Most grenades have an arming lever (aka safety lever or "spoon") held in place by the arming or safety pin to which an arming or pull-ring is attached. To throw, the lever was gripped against the grenade body, the arming pin pulled, and the grenade thrown. This freed the lever, which flew off allowing the firing pin to spring closed and strike the igniting primer, which ignited the delay fuze for the pre-set time delay, and it in turn ignited the detonator exploding the grenade. As a trip-wired booby trap it was taken into account that the arming lever must have unhindered clearance to rotate and fly off the fuze, and that no wires, tape, or other means of securing the grenade to a solid object (stake, tree, etc.) obstructed it.

The most common means of activating grenade booby traps were tripwires. A tug on the tripwire would pull the grenade's arming pin and cause it to detonate after the normal time delay; though the delay train may have been removed, resulting in an instantaneous detonation. Also, the standard fuze may have been replaced by some other form of instantaneous firing device (pressure, pressure-release, pull-release, tension-release).

When rigging a grenade with a trip or pull wire it had to be ensured there was sufficient clearance and that camouflage would not obstruct the rotation of the arming lever to clear the grenade allowing the firing pin to ignite the primer. There might have been a metallic ping as the arming lever flew off and the spring-loaded "mousetrap" firing pin might make a faint pop as it struck and the primer ignited. Most ComBloc grenades used a vertical spring-loaded firing pin that was released when the arming lever flew off. Others had pull-friction igniters. These had a match-like compound that ignited when a ring attached to a pull cord was pulled, though these proved unreliable due to moisture effects.

This US M26 fragmentation grenade is wired to a stake that was pulled up after the grenade was disarmed. A tripwire has been attached to the pull ring. Now disarmed, the pull ring was removed while the lever was held in place and a common safety pin inserted. (Tom Laemlein/Armor Plate Press)

Many of the VC-made and ChiCom grenades were crude and generated poor fragmentation effects. Fragmentation either shattered the cast-iron body into tiny fragments, often sand-like, or simply broke it up into a few large chunks plus some smaller bits. There were not enough large pieces to inflict wounds and the tiny fragments were essentially an annoyance. It was never a good idea to underestimate any grenade, though. They still could be deadly.

US hand grenade arming pins had a 1.25in-diameter split ring with a 1.13in cotter pin retaining the arming lever and spring-loaded firing pin. When pulled, the arming lever (aka "spoon") is held in place by the hand. When the grenade is thrown the lever springs off the grenade and the spring-loaded "mousetrap" firing pin strikes the primer to ignite the delay fuze. Casualty-producing grenades – fragmentation, demolition, WP – have a 4–5-second delay. Burning-type chemical grenades – smoke, riot control, incendiary – have a 1.2–2-second delay. Many troops kept one or more grenade pins in their helmet camouflage band or elsewhere to disarm booby traps and mines. They could be used on Free World and ComBloc grenades and munitions. Most ComBloc grenades had 3.2–4.2-second delays (UZRGM lever fuze) – but not always. ComBloc grenade delay times could be haphazard. The pin could be reinserted in a grenade if it was unnecessary to throw it. To reinsert a grenade pin the grenadier ensured the pin holes in the sides of the arming lever were aligned with the pin hole in the fuze housing and slowly slid the pin though the aligned holes. The grenade had to be thrown immediately if the "mousetrap" firing pin activated. It was recommended that once the pin was removed it was preferable to throw the grenade even if unnecessary rather than risk reinserting the arming pin.

The most commonly used hand grenades found in booby traps are examined here. Many other models were encountered but functioned in similar manners.

The **Mk 2A1 fragmentation hand grenade** was used through World War II, the Korean War, and into the mid-1960s. The "pineapple" grenade had a cast-iron body divided into 54 segments. These ensured a firm grip with muddy and wet hands. They only broke up into several irregular pieces. Pineapples and later US "frags" were painted OD with yellow markings.

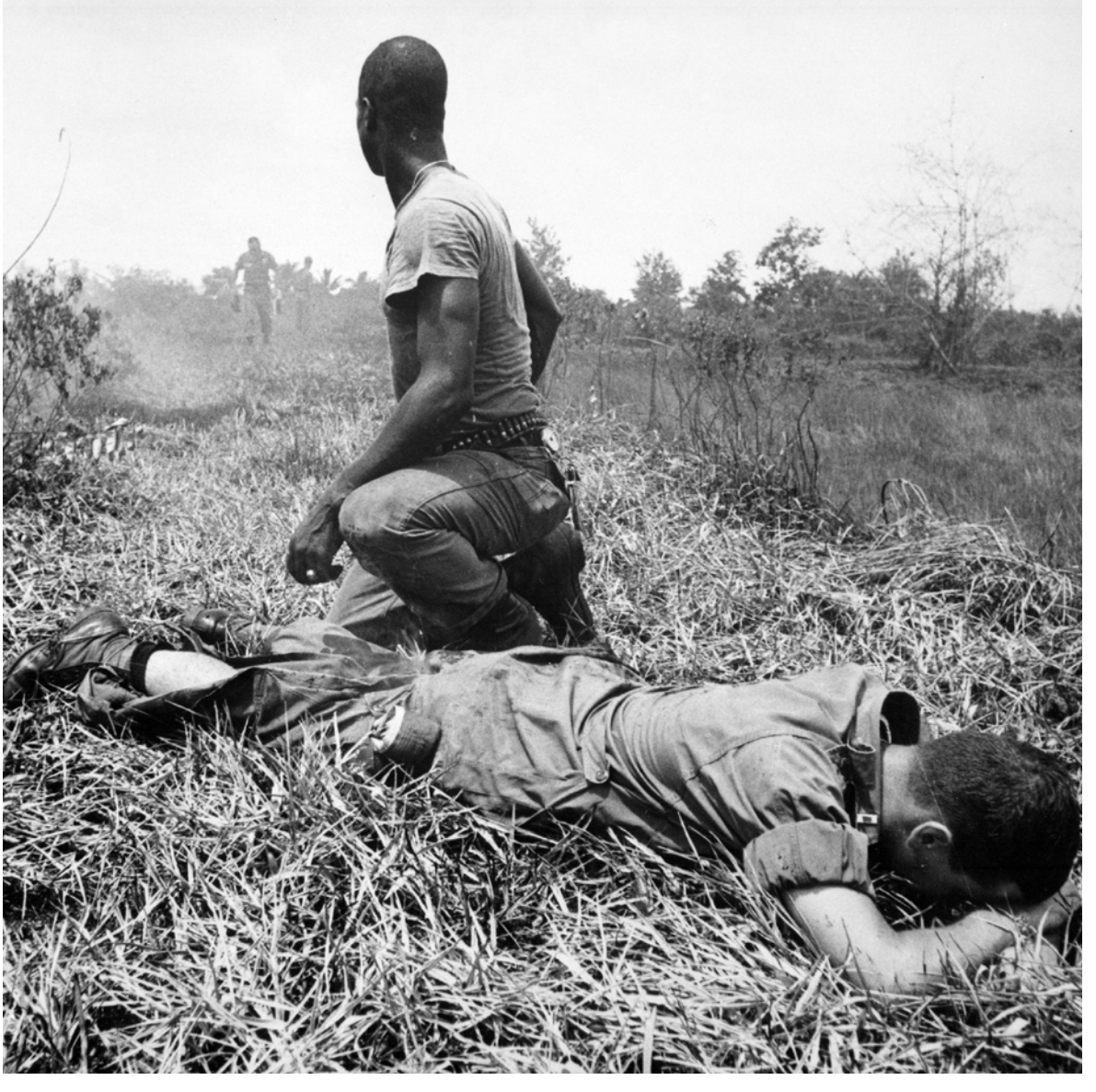
The **M26 hand grenade** or "lemon grenade" was introduced at the end of the Korean War (1950–53) to increase lethal fragmentation and provide a more evenly dispersed fragmentation pattern. It had a sheet-steel, oval body lined with coiled 0.13in-diameter steel wire that was scored every 0.20in, generating 1,150 0.13-grain fragments to inflict fatal or disabling wounds within 15m (49ft). Killing radius was 5m (16ft). A further improvement was the M26A1 with 0.13in square wire scored every 0.13in; this wire was used in all subsequent models. There was a confusing number of M26-series grenades, including (* with safety clip): M26, M26A1 (M61*), M26A2 with M204A2 fuze, M26A2 with M215 delay fuze (M56*), M26A2 impact (M57*). Some models had impact fuzes and the lever on early impact grenades was red with or without IMPACT in black. Later grenades had only IMPACT embossed on the lever. Troops rejected impact-detonated grenades. If dropped after arming or striking vegetation they caused friendly casualties. Regardless of designations, these grenades were colloquially known as "M26s." M26A1/M61s were widely used in Vietnam and supplied to all Free World forces. They were also license-made by Australia (M26A1, M26A2 impact). According to TM 43-0001-29, *Army Ammunition Data Sheets for Grenades*, "The hand grenade safety clip [aka "jungle clip"] is designed to keep the safety lever in place should the safety

**ABOVE LEFT**
A stick-type fragmentation hand grenade is mostly buried here, held in place by two bamboo stakes. Its camouflage has been removed. The white pull cord (below center and visible over the right-hand stake) is attached to a tripwire. (Tom Laemlein/ Armor Plate Press)

**ABOVE RIGHT**
A Bulgarian-made F-1 fragmentation grenade with a doubled rubber band securing the arming lever. Various types of tape could be used. The grenade would be inserted in a vehicle fuel tank or spare fuel can after pulling the arming pin. The rubber bands or tape would eventually dissolve and detonate. The time delay could be hours or days. The plastic fuze-well plug was in the grenade when in its shipping crate and the UZRGM fuzes carried in a separate compartment. Troops learned to look for shipping plugs, arming rings, safety pins, packing materials, and bits of tape, cord, or wire that might indicate the presence of booby traps. (Author)

pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin."

The first version of the US **M67 hand grenade** was the M33, seeing early service in Vietnam. It lacks the safety clip, which the M67 introduced in 1968. The "baseball grenade" has 0.13in-thick steel spheres internally pimpled with a 0.19in segmentation pattern. It breaks up into irregular-shaped pieces of 2–12 or more "pimples." Its lethal radius is 5m (16ft), but can cause casualties up to 15m (49ft), dispersing stray fragments up to 230m (252yd). The fragmentation radius was relatively consistent regardless how the grenade was oriented after landing. It has a lever-release fuze. A second model was the M33A1, an impact-detonated grenade. It was designated the M59 with the safety clip. Like other impact-detonated grenades, it was disliked by the troops and fell from use. (The M67 is still in use at the time of writing.)



A lieutenant, injured by a VC-planted booby-trapped white phosphorus grenade, is treated by a medical corpsman. Wounds by booby traps were much more numerous than deaths, but the main purpose of booby traps was to damage morale. (US Information Agency/Wikimedia/Public Domain)

The French **OF M1937 offensive** and **DF M1937 defensive hand grenades** (*Grenade à main offensive OF M1937 et défensive DF M1937*) both had oval bodies with flat bottoms. They were widely used in Indochina and were still encountered after the Americans arrived. They have five-second lever-delay fuzes of varied design. The OF37 blast grenade has a thin aluminum body with a circumference rim allowing night identification. The DF37 fragmentation grenade has a cast-iron body. Other types of French grenades were occasionally encountered.

The Soviet **F-1 high explosive hand grenade** (*F-1 Fugasnyy Ruchnaya Granata*) was copied from a French World War I design and was still in use in Vietnam and made by most Warsaw Pact countries, and also China (Type 1). Like the US "pineapple grenade" its fragmentation effects were limited.

The Soviet **RGD-5 distance hand grenade** (*Ruchnaya Granata Distantsionnaya 5*) has an oval-shaped body with a pre-scored fragmentation liner (300 fragments) and uses the UZRGM 3.2–4.2-second lever-delay fuze. It is often assumed to be a blast grenade owing to its two-piece smooth body. They were also produced in China (Type 59), Bulgaria, East Germany, and Poland. F-1 and RGD-5 body colors vary from green to brownish drab. Numerous other types of Soviet and Chinese grenades were encountered.

The ChiCom **Type 67 stick hand grenade** has a wooden handle containing a friction-pull igniter – a pull cord with ring held in place in the handle's end cavity by a screw cap. The smooth cast-iron head generates insufficient fragmentation. The delay time is 3–5 seconds. They, and copies, were used in booby traps only being rigged with trip or pull wires.

**Common hand grenade characteristics**

| Grenade | Origin | Weight | Height | Diameter | Filler (weight) |
|---|---|---|---|---|---|
| Mk 2A1 | US | 21oz | 4.49in | 2.28in | TNT (1.85oz) |
| M26 | US | 16oz | 3.90in | 2.49in | Comp B (5.75oz) |
| M67 | US | 14oz | 3.54in | 2.52in | Comp B (6.50oz) |
| OF M1937 | France | 19oz | 3.74–4.13in* | 2.36in | TNT (3.17oz) |
| DF M1937 | France | 21oz | 3.74–4.13in* | 2.17in | TNT (3.17oz) |
| F-1 | USSR | 22.9oz | 4.88in | 2.17in | TNT (1.76oz) |
| RGD-5 | USSR | 10.9oz | 4.61in | 2.28in | TNT (3.93oz) |
| Type 67 | ChiCom | 17.6oz | 7.87in | 1.97in | TNT (1.79oz) |

* Height depended on fuze model.

**BELOW LEFT**
A recreation of a Free World force booby trap left in an abandoned VC base camp to await the enemy's return. An M26 hand grenade is resting on bamboo slats to prevent it from being pressed into soft ground. Even if dry when emplaced, it might later rain. The arming lever is held in place by the weight of an M60 machine-gun ammunition can filled with earth or rocks rather than live ammunition. The arming ring (visible under the "LC" on the ammunition can) would be pulled and the hole would be partly backfilled to hide the grenade. (Author)

**BELOW RIGHT**
A grenade trap used by both sides involved an M26 grenade being fitted in a C-ration B-unit can. Here the can is wedged between two limbs, but they could be secured by tape or wire. A soldier tripping the tripwire pulled the grenade out of the can. (Here, a white string has been used to make it more visible, while the grenade and can have been camouflaged.) It may or may not have had its normal 4–5-second delay time. Any type of lever-operated grenade could be used. (A commercial can is used here; "C-rat" cans were OD-painted.) (Author)

**ABOVE LEFT**
An M26 grenade is taped (alternatively it could be wired) to a small tree with a tripwire fastened to the pull ring. The US issue OD tripwire has been bent and crinkled to give it a more natural appearance. (Author)

**ABOVE RIGHT**
Looking downward on a PAVN fragmentation grenade taped to a small tree, courtesy of Trey Moore. The wooden end cap on the short wooden handle has been removed and the pull ring and pull cord emerge from the hollow handle. A tripwire attached to the pull ring will activate the friction fuze when pulled. (Author)

# EXPLOSIVE BOOBY TRAPS AND MINES

These devices were the most destructive and were found in countless variants. They could range from employing mere ounces of explosives to hundreds of pounds, although they were typically on the lighter side. Explosives were of course highly destructive, generating blast and fragmentation. The construction and installation of such booby traps demanded skilled personnel. Free World forces seldom disarmed them owing to the danger, instead blowing them in place. Most VC mines were large homemade command-detonated mines, usually intended to be emplaced along roads to attack vehicles. Others were submerged or bottom-sitting command-detonated versions for attacking ships on rivers and the Lòng Tàu shipping channel to inland Port Saigon (not a subject of this book).

Buried landmines, whether US or ComBloc, were little used, though there were areas around abandoned French forts and outposts that had been mined. Most had deteriorated, but the suspected mined areas were avoided unless Free World forces had use for them.

There were a wide range of demolition charges containing different types of high explosives. Those best suited for antipersonnel booby traps weighed less than 2lb. Many had threaded integral fuze wells accepting different types of standardized firing devices. Most firing devices used the almost universally accepted No. 8 blasting cap (2–2.5in long, 0.25in diameter). Command-detonated mines and booby traps required a firing device to generate an electric charge, or one or more batteries, to ignite the HE charge when activated through an electric wire to detonate an electric blasting cap – similar to a No. 8 cap with two thin electrical leads. Virtually any munition

containing explosives could be used for mines and booby traps. Demolition charges were widely used in prepared sizes and weights, and protected by some form of waterproof packaging. If using a solid explosive such as TNT, they usually possessed cast and threaded fuze wells. ChiCom and Soviet demolition charges were often 200g (7.05oz), 400g (14.11oz), 500g (1.10lb), or 1kg (2.20lb). Plastic explosives or C-4 are pliable, and readily cut into necessarily sized pieces. A hole could be punched into a block to accept a blasting cap or detonating cord.

Artillery and mortar rounds of all calibers, other munitions, and even 500lb aerial bombs, were rigged as command-detonated mines. Some were activated by tripwires. They were devastating and able to damage a truck severely or even blow it off the road. Needless to say, manhandling aerial bombs into hide sites was demanding. Buried mortar rounds on a trail for instance could wipe out a squad. Bombs and artillery rounds had relatively thick walls generating large fragments. The HE charge was a small proportion of the overall weight. Mortar rounds had thinner walls and a larger HE charge, resulting in more blast and numerous small antipersonnel fragments. Bombs and projectiles possessed a threaded fuze well lined with an aluminum cup. For mines and booby traps the nose fuzes were removed and the detonator cap inserted in one, usually packed with C-4. On occasion some of the projectiles did not explode with the main one and EOD had to be called to destroy the duds.

Time (aka delay or safety) fuze was 0.25in in diameter with a waterproof woven outer casing with a black-powder core. The US M700 time fuze was green, and burned at a rate of 40 seconds per foot (130 seconds per meter). Before use, 6in of the end would be cut off as it collected moisture, affecting its burn time. Its actual burn time varied slightly. Detonating cord (detcord) was used to link charges to achieve simultaneous detonation. Clear plastic tubing, 0.25in diameter, has a core of sensitive white PETN high-velocity explosive, detonating at 21,000ft/sec (6,405m/sec).

Detcord is an explosive charge in its own right. To detonate it a non-electric blasting cap was taped to an end and a length of safety fuse was inserted in the cap, or an electric blasting cap was tapped on, or some form of mechanical firing device attached. The detcord could be inserted in the fuze

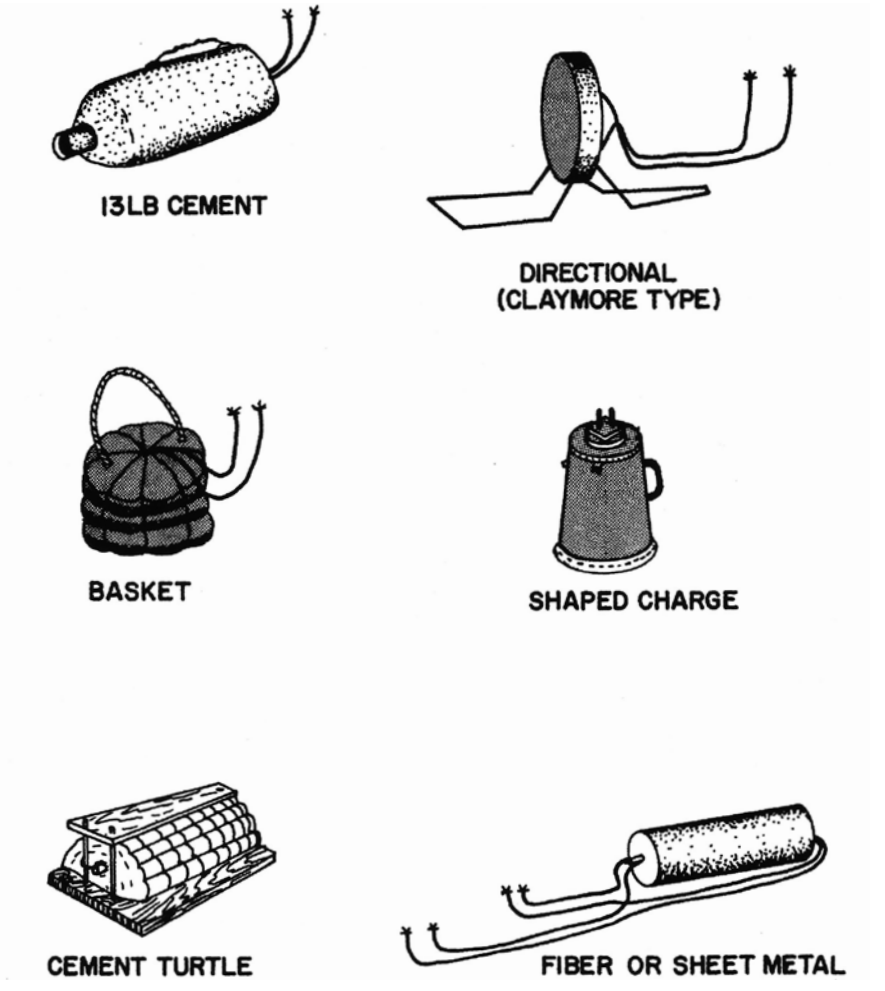
**ABOVE LEFT**
An M113A1 armored cavalry assault vehicle with half its road wheels and its entire track blown off by a buried command-detonated mine. The crew usually survived explosions of this size, but probably with some injuries. (Tom Laemlein/Armor Plate Press)

**ABOVE RIGHT**
This M113A1 armored personnel carrier's rear drivewheel sprocket and a road wheel survived, but other rubber-rimmed road wheels forward of them were blown off. The concussion effect on troops riding inside meant they could be injured. Most troops preferred to ride atop the vehicle even if they were vulnerable to booby traps suspended in trees. (Tom Laemlein/Armor Plate Press)

wells of demolition charges (with blasting cap crimped to the end to ensure detonation of the main charge) or several wraps of detcord turned around the charge to link any number of charges. When the detcord was fired it detonated instantaneously, blowing all connected charges. There is not even a discernable fraction of a second between each detonation.

Communist Bloc (ComBloc) identified munitions and equipment produced by the USSR, Communist China, and the various East European Warsaw Pact states. This source provided the majority of VC/PAVN booby-trap materials. Captured US munitions were extensively employed and some use made of leftover French items in the early years. Occasionally other European munitions would be encountered.

Most munitions are painted for protection from rust and corrosion, for camouflage, and to identify use and/or function, and/or filler. Color coding and markings (designations, bands) varied widely between countries, time periods, and even manufacturers. Never assume similar coloring on two different types of devices had the same meaning. While most ComBloc munitions had similar coloration, there were differences in a wide range of olive green/brown shades as well as wide use of black. US munitions could be confusing because some still bore 1936–61 colors and markings, and continued to be issued into the 1970s. Most munitions from 1961 used




A selection of VC "jungle factory" command-detonated mines from *Counterinsurgency Lessons Learned No. 53*. The electrical firing wire leads are shown on most of the mines. At top left, the 13lb "cement mine" had an HE charge cast inside. Detonated, the mine shattered and the fragmented concrete was deadly. At middle left, the "basket charge" consisted of any type of HE carried in a basket of woven palm strips or bamboo, carried to and buried in the mine site. It relied on blast effect. At bottom left, the "cement turtle" was a concrete mine; whatever was used to cast the concrete had a segmented-style pattern which was expected to improve fragmentation, but it probably did not. Small boards helped hold the mine. At top right is the disc-shaped DH-10 Claymore-type directional mine. At middle right is a shaped charge; large (20lb and greater) mines projected larger fragments than the US M18A1 and were effective against vehicles and could blast gaps through barbed-wire barriers. At bottom right is a charge fabricated from recovered fiberboard or sheet-metal artillery propellant or a projectile cylinder; this example has two electrical firing leads for positive detonation. (US Army)

## "I stepped on a mine."

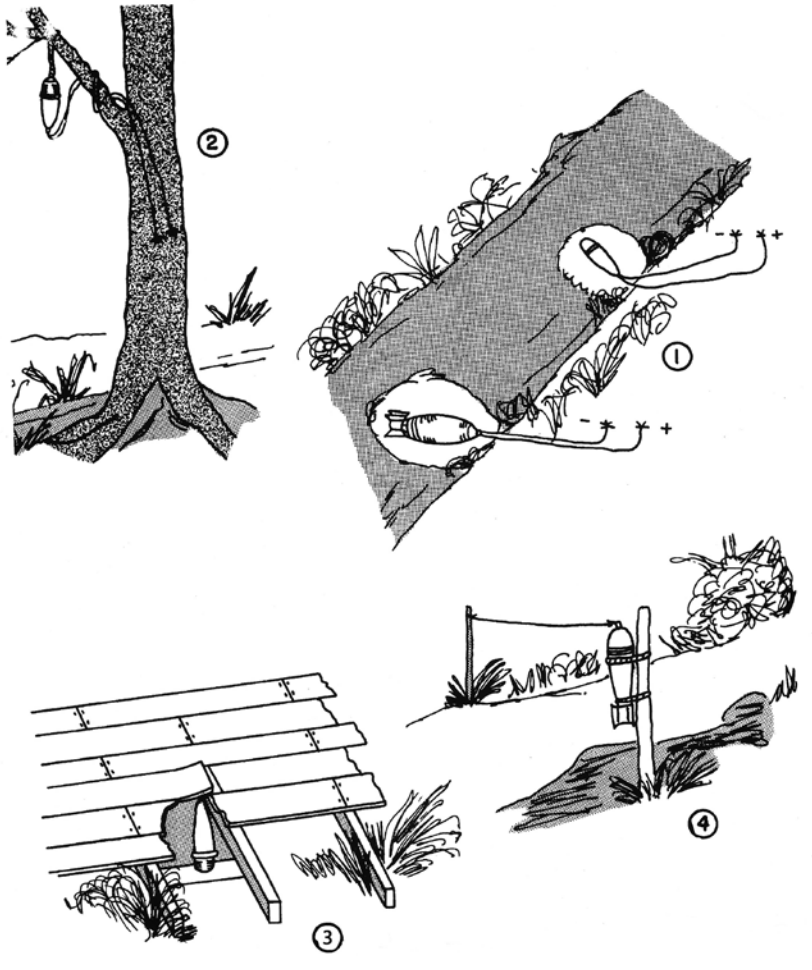
Movies and TV shows have often depicted an unfortunate grunt stepping on a mine, hearing an ominous click, looking down at his boot to find he is standing on a mine, and freezing in place. The rest of the platoon gathers around in a cluster (for good camera framing), warning him not to move his foot or the mine will explode. They usually come up with some inane means of getting the guy off the mine. In recent post-Cold War and current-conflict movies, similar mines have been depicted, usually with the unfortunate doomed individual left standing all by his lonesome until he runs for it or can no longer stand. In the movies it is invariably depicted by showing a long shot of a forlorn wooded area with a sudden piercing scream followed by an echoing explosion.

There is not and never has been any such mine fuze in anybody's inventory in so far as this writer has been able to determine. A considerable number of references were researched and specialists consulted, including US Army Explosive Ordnance Disposal personnel and the Army Engineer Center.

This myth originated from the German Schrapnellminen 35 and 44 (shrapnel mines), aka "bouncing Betty" or "S-mine," and a misunderstanding as to how such mines functioned. The post-World War II US M16 antipersonnel mine was based on the Schrapnellmine 44. Whether the mine was activated by a pressure fuze or tripwire made no difference, it was activated and would fire in a few seconds whether the individual removed his foot or not. The buried "S-mine" was activated by horizontally strung tripwires set a few inches off the ground. When tripped, the mine fired a cylinder several feet into the air with a muffled pop, which then detonated, showering nearby troops with 360 steel ball bearings. It could also be fitted with a pressure fuze that detonated the mine when stepped on. Either way, there was an average 3.9-second delay between tripping the wire or stepping on the mine before the cylinder was fired – in which time troops knew they could not outrun it, even if they realized they had triggered it. It made no difference if they removed their foot from it or not, it was going to detonate. The shrapnel could reach over 150m (164yd).

The following description of the S-mine is from the July 1944 issue of the US Army's *Intelligence Bulletin* based on experiences in Italy: "Between the firing of the igniter and the ejection of the S-mine from the ground, there is a delay of from 3 to 6 seconds [average was 3.9 seconds]. Between the ejection and the detonation, there is a delay of from 0.4 to 1.4 seconds [average was 0.6 seconds]. In each case the variation seems to depend on the condition of the explosive and of the ground in which the mines are laid. It has been observed that eight out of ten mines rise from 4 to 10 feet and that about two out of ten mines explode in the ground. (There are occasional duds.) A dead weight of 140 lb (approximately that of a man) will not prevent an S-mine from rising in the air before exploding. Therefore, a man who remains standing on a mine becomes a serious casualty and does not necessarily prevent others nearby from suffering injuries" (War Department 1944a).

It has been suggested that mines of this type may have been fitted with a pressure-release type firing device such as the US M5 "mousetrap." It is used in booby-trapping and can be fitted to an antipersonnel mine. This is not the case. A pressure-release device functions by having a weighty object set atop the firing device. It is armed by pulling the arming pin. When the object is lifted off, the explosive charge detonates. It is not activated by someone stepping on it and then removing their foot. It must already have at least a 5lb object on it holding the arming lever in place, which when removed instantly activates the mine.



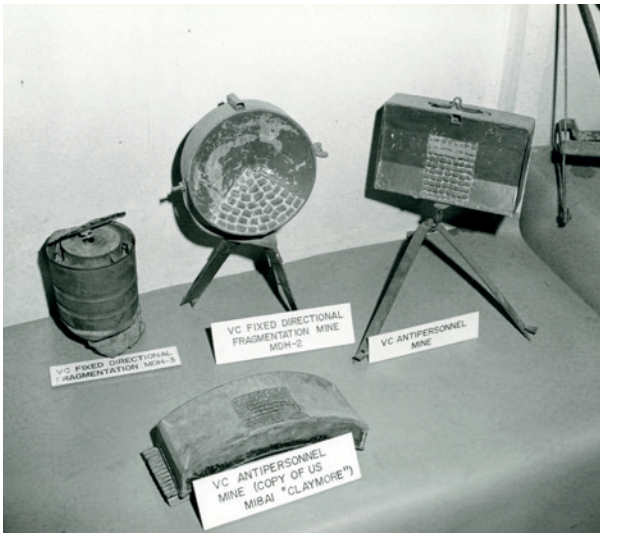

These electrically command-detonated artillery and mortar projectiles described in *Counterinsurgency Lessons Learned No. 53* were made from recovered projectiles. Artillery and mortar projectile dud rates were less than 5 percent; cluster-munition bomblets were up to 14 percent. The nose fuzes were removed and electric detonators inserted, usually with the remaining void filled with C-4. In the first illustration (**1**), 81mm mortar and 75mm artillery projectiles have been buried deep under an unimproved road; the earth backfill has been left untamped to direct more of the blast and fragmentation upward. A 105mm projectile has been suspended from a tree limb (**2**) to airburst over troops or a vehicle. A 105mm projectile fitted with a pressure-detonated fuze (**3**) has been emplaced under a building's floorboards. A 60mm mortar projectile (**4**) has been fitted with a pull-fuze and across-the-road tripwire to attack vehicles. While 105mm M1 HE projectiles weighed 33lb with 4.8lb of TNT, older-type 81mm M43A2 mortar projectiles were 6.9lb with 1.22lb of TNT. (US Army

the new NATO color coding and markings. The two systems were similar in some ways, but there were major differences, one being that chemical and smoke grenades were light gray prior to 1962 and light green during Vietnam. (M18 red, yellow, violet, and green smoke grenades were OD with light-green markings for camouflage purposes while AN-M8 burning white smoke and M34 WP bursting smoke grenades were light green, the former with black and the latter with red and yellow markings.) HE munitions were OD with yellow markings.

The US provided several types of booby trap firing devices (see page 29). These were fitted with some means of activating the trip or pull wire or pressure-release, had a primer fitted to a nipple to which a blasting cap was crimped, a threaded fitting screwed into grenade and mine fuze wells, and locking and positive safety pins. These devices were not always available in the field.

The **M1A1 pressure firing device** had a horizontal tubular housing with fastening flanges and was fitted with a three-prong pressure device. The M1 pull firing device is tubular with a trip or pull wire attached. The **M3 pull-release firing device** was tubular and would activate when the tripwire was pulled or cut – a tension-release device. The **M5 pressure release firing device** was similar to, but larger than, the grenade "mousetrap" firing device on which an item weighing at least 5lb was set and would detonate when lifted.

Tripwire might be made from thin but strong vines (deteriorated and broke easily), any type of thin wire, a single strand unraveled from two-strand WD-1/TT field telephone wire (too thick and shiny to be effective), thin but stout twine (if white it was dirtied or stained), monofilament fishing line, or US issue tripwire. This was very thin and flexible 40ft steel wire painted OD and sand yellow or bare steel – two 40ft lengths of each color totaling 160ft – issued on wooden spools with trip flares and booby trap firing devices. The VC could often buy tape, wire, and monofilament line in local markets. They cut the OD cloth of discarded M16 rifle bandoleers into thin strips, tying them together to make difficult-to-detect "tripwires."




VC/PAVN command-detonated mines. At left is an explosive and fragmentation charge made from a readily available No. 10 (1-gallon) can. In the center is a MON-2 (aka DH-10) fragmentation mine; the detonator fits in a backside fuze well. At right is a homemade "Claymore" fragmentation mine. (The face covering has been partly cut away showing the embedded fragmentation on the second and third mines.) In the front is a homemade copy of the US Claymore mine. The legs or stands on these mines varied greatly. (Tom Laemlein/Armor Plate Press)

Type III nylon cord, offering 550lb tensile strength and 0.16in in diameter, was used as parachute-suspension line, tie-down cords, "dummy cords," and fulfilled any other need for stout cordage. Also known as "550 cord" or "paracord," its OD nylon sheath contained 7–9 white core nylon yarns. It was too thick for general tripwire use except in dense vegetation.

Tripwires had to be firmly fixed to the anchor end and well-fastened to the booby trap's arming pin/ring. Tripwires were usually taut but could be loose in some applications making them a bit more difficult to see – straight lines and edges are uncharacteristic in nature. They could be rigged any height off the ground dependent on terrain and vegetation. By nature they were usually close to the ground. While tripwires were mostly strung horizontally, they could be rigged at an angle, e.g. one end fixed to the tree-fastened booby trap a foot off the ground and the wire running upward 45 degrees and anchored to a 6ft-high tree limb, especially when there was hanging vegetation. This unexpected arrangement would be more difficult to detect.

Commonly employed by both sides was the **grenade can trap**, an armed, lever-type grenade with the delay element removed and with a tripwire attached, placed in a horizontal can. The can had to be large enough to accept the whole grenade but small enough to hold the lever in the safe position. A pull on the tripwire pulled the grenade from the can, releasing the lever and firing the grenade. The US M26 hand grenade was the most commonly used grenade for this purpose. C-ration cans were used most often as the receptacle. An appropriate-sized hollow bamboo section could also be adapted to this application. In this and other applications of hand grenades as booby traps, the delay element was usually removed from the grenade fuze, resulting in instantaneous detonation after initiation. For this reason, troops were cautioned against attempting to reuse hand grenades found in the field.

Another method was the **grenade booby trap**. It was secured by wire or tape to a tree trunk, post, or stake, several inches to 3ft off the ground. The tripwire was secured to the same anchors on the other end and the wire fastened to the arming ring with the arming pin bent straight so it could be pulled out with little resistance. Grenades were seldom set on both ends owing to being hazardous to arm when employed in this fashion.

Another common grenade booby-trap activation means was the **grenade pressure release**. A grenade was placed on its side in a hole under an object (discarded weapon, dead body, ration container, or other objects of sufficient weight that would attract attention). When the object was lifted off the grenade, which had its arming pin removed, the arming lever flew off and detonated after its normal delay – or instantly if the delay was removed. Clearance was necessary to ensure the lever could rotate to release the firing pin.

Grenades with the delay train removed were intentionally left behind for the enemy to find and ultimately use with lethal results.

The **bamboo arch** was an alternative to the conventional horizontal tripwire with the vertical tripwire suspended from a tree limb, curved bamboo pole, or a two-pole inverted "V" "arching" over a trail. A grenade with the delay element removed was attached to the poles' apex. The tripwire extended from the safety pin to a ground stake. Few pointmen looked for vertical tripwires. An airburst achieved a wider casualty radius than a grenade near the ground. They were often employed at night to warn of approaching troops. During the day, the tripwire was detached from the stake and placed to the side, thereby allowing the trail to be used in daytime.

**Tank booby traps** were meant to inflict casualties among troops riding atop APCs and tanks. Troops habitually rode atop the vehicles rather than inside to avoid stifling heat, HEAT round fragmentation, and mine detonations, the more common threats. Two vertical 15ft-tall bamboo poles, spaced 30–40ft apart, straddled a road, trail, or "tank bust." A wire was suspended between the two poles and might sag to 10–14ft above the ground. Two grenades with delay elements removed were attached to the wire. A pull wire was attached to the arming pin on both grenades and fastened to the poles. A vehicle passing under the horizontal wires would snag the wires with its 10–14ft radio antenna, pulling the pins and detonating the grenades. Another version involved hiding a Claymore or fragmentation charge in trees along a trail or "tank bust" 10–14ft above the ground. This would blow off troops riding atop APCs, amtracs, and tanks.

**Booby-trapped gates** were simple to rig and presented so obvious a booby-trap target that it is surprising that Free World troops fell for it. Most gates in villages and on farms were constructed from bamboo, but they could be built out of anything including boards, dismantled ammunition crates and pallets, and U-shaped barbed-wire pickets. One method involved a grenade being placed near the gate with a tripwire on the arming pin and a short pull-wire secured to the gate. The grenade had to be above ground and well concealed or the lever would not function. An alternative was to bury a demolition

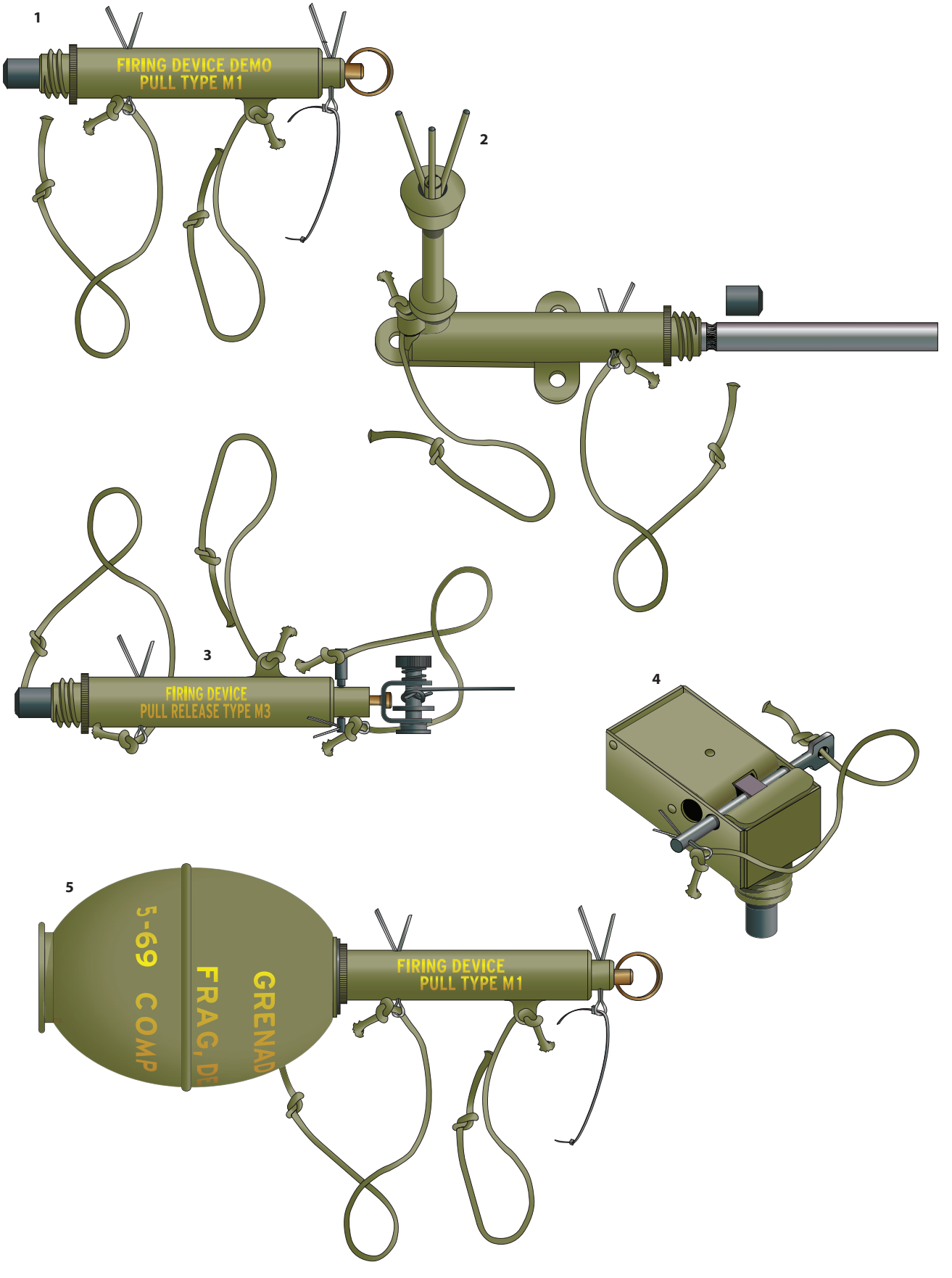
**B**

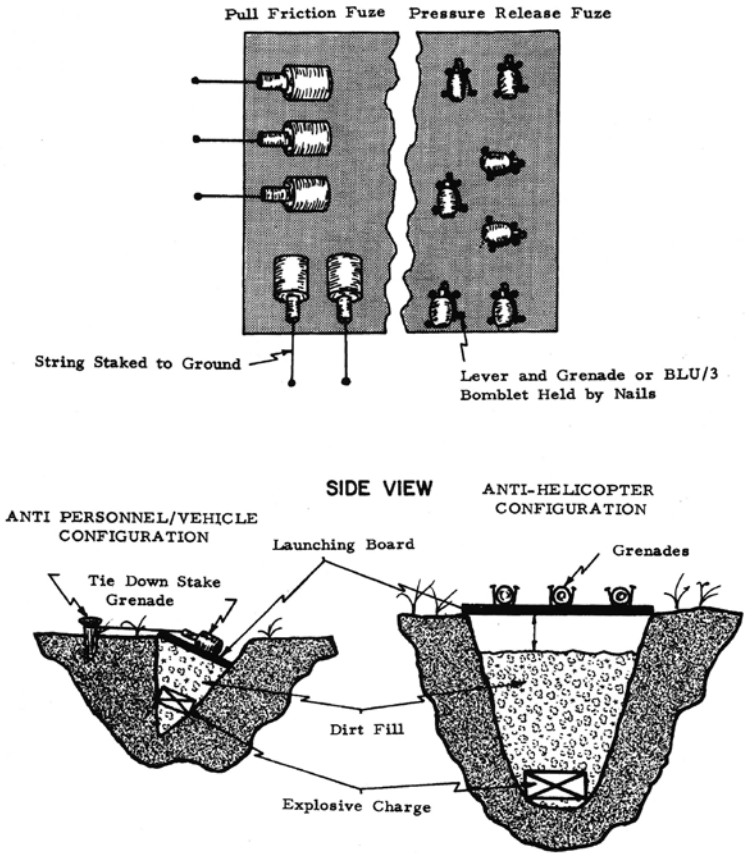
**US DEMOLITION FIRING DEVICES**

See The US armed forces issued a number of types of demolition firing devices used as booby traps activated by various means. All were fitted with a standard-diameter threaded adapter (coupling base). An M7 non-electric blasting cap sufficient to detonate a grenade or other explosive charge was crimped to it. When issued, the blasting-cap nipple was protected by a small black plastic or cardboard cap. The blasting cap could be screwed into the fuze well of all US hand grenades as well as booby-trap fuze wells on most US landmines as an anti-tampering device. Blasting caps were issued with a small tripwire spool and a couple of nails. Obviously, captured firing devices were highly sought after by the VC.

The most commonly used, the M1 pull firing device (**1**), required a 3–5lb pull of the tripwire. The M1A1 pressure firing device (**2**) was provided with a three-prong pressure head and an optional extension. It required at least 20lb pressure to activate. The M3 pull-release firing device (**3**) had a tension winch to tighten the tripwire. If tripped it required a 6–10lb direct pull, or if cut would instantly activate. The M5 pressure-release firing device (**4**) required at least a 5lb weight to restrain the pressure-release plate. When the retaining object was removed, the device activated instantly.

Also shown is an M26 fragmentation grenade fitted with an M1 pull firing device (**5**); hand grenades fitted with the M1 pull firing device were among the most widely used US booby traps.


1
FIRING DEVICE DEMO
PULL TYPE M1
2
3
FIRING DEVICE
PULL RELEASE TYPE M3
4
5
FIRING DEVICE
PULL TYPE M1
5-69 COMP




These antipersonnel/vehicle/helicopter grenade projectors were described in *Counterinsurgency Lessons Learned No. 53*. The board or panel to which any type of hand grenades fitted could be configured in a variety of manners. Basically, an electrically detonated propelling charge buried in loosely tamped holes was detonated to blow the grenades skyward to rain down and detonate, after their normal time delay, in the air (preferred) or on the ground. (US Army)

charge with a pull fuze attached to the pull-wire. Another method was to bury and camouflage the grenade so the gate's bottom brace just above the ground held the arming lever in place. There needed to be clearance for the lever to rotate when the gate was opened. The arming pin was removed. Troops were taught to examine gates closely before opening and preferably to tie a rope to a gate and pull it open from under cover. Hooch doors were similarly booby-trapped.

The VC often **booby-trapped flags and banners** found in their own villages and base camps as well as Republic of Vietnam flags and posters in government-controlled villages they had occupied. Opposing sides habitually tore these down. A grenade or demolition charges could be fastened to the pole below the flag to achieve an airburst when the lanyard was pulled to bring down the flag. The grenade/charge could be buried at the pole's base

**C**

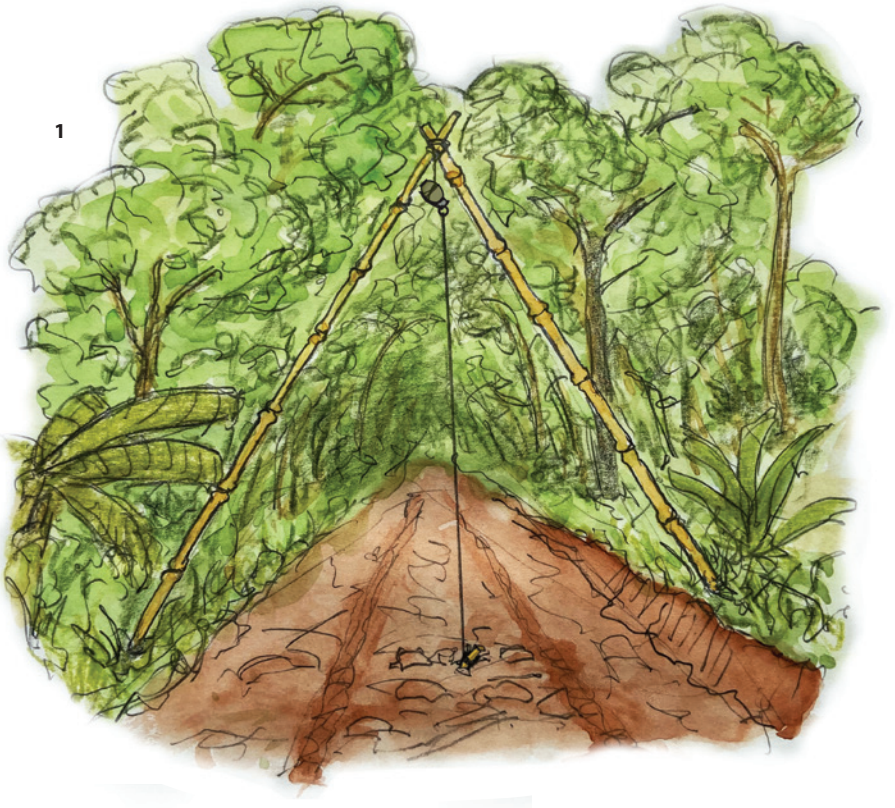
**VC EXPLOSIVE ANTIPERSONNEL BOOBY TRAPS**

See the main text for additional details. Variations of these were endless. In these illustrations, camouflage is omitted so details can be seen. The use of camouflaging materials had to be carefully arranged to prevent such materials from hampering the booby traps' functioning.

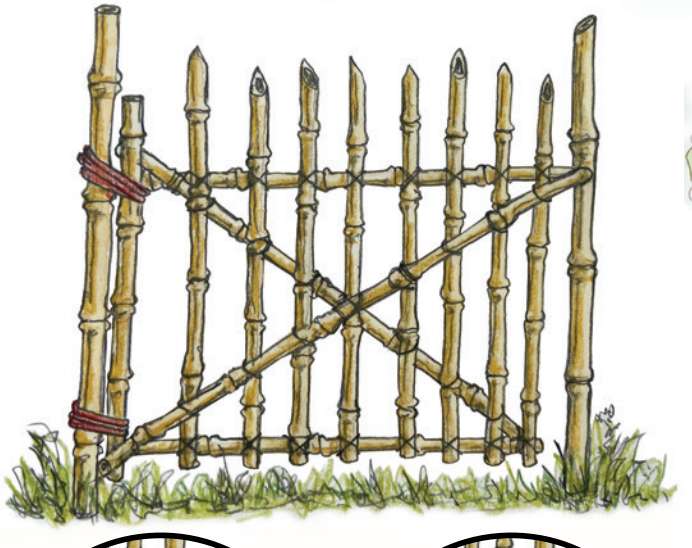
The bamboo arch (**1**) consisted of two poles forming an inverted "V" and was placed over a trail with the grenade at the poles' apex. A vertical tripwire ran straight down to the stake.

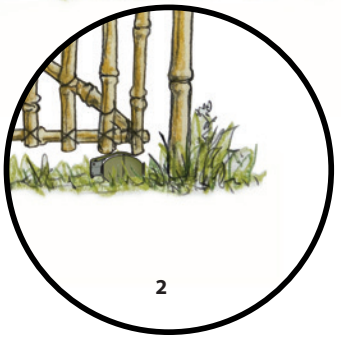
Booby-trapped gates and doors were often rigged simply by wedging a grenade, pin removed, below the gate or door frame and hiding it with mud or grass (**2**). It could be lodged at the top of a door. More difficult to detect was a grenade hidden a few feet away and connected to the gate or door by a pull wire (**3**).

Tree-mounted booby traps (**4**) were mortar or artillery projectiles hidden in treetops. The command-detonated electrical firing wire was run through the trees to a hidden observer/firer who would command-detonate the charge to archive an airburst with a wider casualty radius.



1





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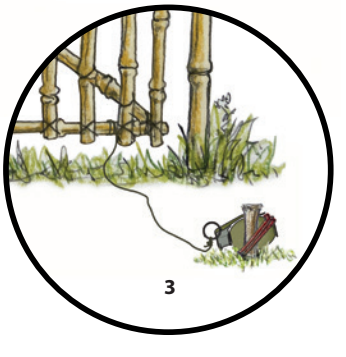


3

4

A 60mm M49A2 HE mortar round with an M1 pull-type firing device attached to a tripwire just below and to the right of the fin assembly. It was slightly more powerful than a hand grenade but generated more fragmentation. While the 60mm mortar was no longer used by the US Army, it was used by the ARVN, US Marines, US Special Forces, and VC/PAVN forces. (Tom Laemlein/Armor Plate Press)

and might be fitted with pull-friction devices. Banners and posters would be arranged to detonate hidden charges – under a building's eave or behind a bulletin board – when they were torn down.

The **cartridge trap** originated in World War II with the Japanese. It was constructed of an approximately 2.75in-section of bamboo glued to a small base board. A small nail was driven through the board protruding 0.13in and a 7.62mm rifle cartridge inserted. Buried with only the bullet tip exposed, it was easily camouflaged by grass or leaves. Numerous traps would be sown in an area. Stepping on the bullet pushed it down on to the nail which acted as a firing pin and "shot" the bullet up in to the victim's foot. Stepping on it seriously crippled the victim and after passing through the foot probably hit the calf or thigh.

The **bicycle mine or bomb** was built using a bicycle with most of its tubular frame packed with plastic explosives – essentially a rolling pipe bomb. Wires connected a simple wristwatch timer to batteries and an electric detonator, all housed inside the headlight. When the watch hand met the electric contact, the bomb detonated. An alternative was for the firing system to be connected to the headlight power generator so it would be detonated when the bicycle was moved. Additional explosives or Claymores might be hidden in saddlebags, a bag/carton on the rear wheel rack, or front handlebars basket. The most common French-made bicycle brands were Peugeot and Mercier.

**Tree-mounted booby traps** involved suspending mortar or howitzer projectiles under 105mm in caliber amid trees over a road or trail. The fuze was removed, the fuze well was packed with plastic explosives, and an electric detonator was inserted. The firing wire was run through the tree limbs to a hidden firer's position. It was command-detonated with wide fragmentation coverage. The projectiles were easy to camouflage and troops did not habitually practice searching overhead.

Several **roof grenades** were hidden within thick roof thatching with the arming levers held in place by thick rubber bands or twine and the pins removed. If Free World troops torched hooches, the bands or string burned off and the grenades detonated. The delay element usually remained.

**Fuel-tank booby traps** had the grenade's arming lever wrapped with rubber bands or adhesive, cellulose, or masking tape. The pin was pulled and the grenade inserted into a vehicle fuel filler opening. The tape dissolved over time. If a longer delay was desired, more tape wraps were made. No

**D**

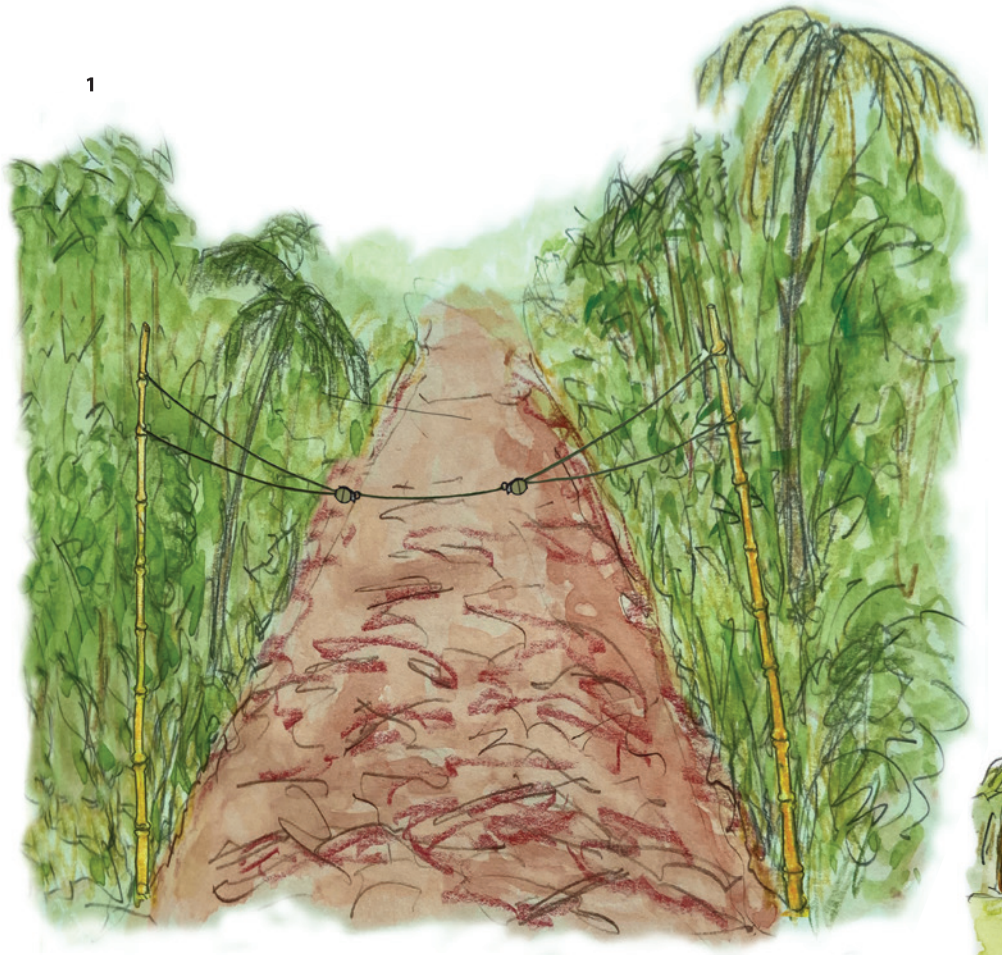
**VC EXPLOSIVE ANTIVEHICLE BOOBY TRAPS**

Tank booby traps (**1**) varied in design and were intended to attack exposed crewmen and passengers riding atop tanks, APCs, or other vehicles. They had tripwires 10–14ft above ground that would be snagged by the APC's radio antenna. The grenade would detonate above the vehicle. The tripwire could also be fastened to a Claymore rigged in a tree.

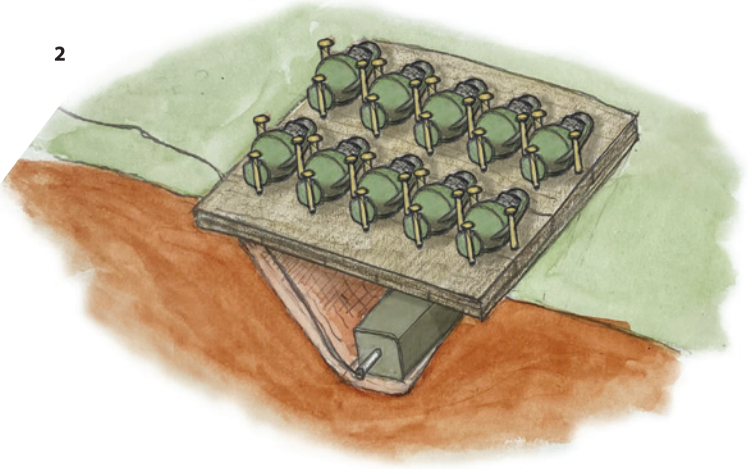
Elaborate anti-helicopter grenade launchers (**2**) consisted of a board with nails driven in to hold ten or so grenades and would retain their arming levers after the pins were pulled. An explosive charge was placed in a hole with the camouflaged board placed over it. An observer/firer at the edge of a possible Free World LZ command-detonated the charge as the helicopters approached and the grenades airburst.

The helicopter can trap (**3**) consisted of four stakes arranged up to 50ft apart in an "X" pattern on a LZ. Horizontal cans were wired to the stakes. The taut wires were some 2ft off the ground. Landing helicopters setting down on the wires pulled the pinless grenades from the cans and detonated them. Troops exiting the helicopters might also trip the wires.

1



2



3

delay time could be calculated. Military vehicles had 4in-diameter fuel filler openings into which a grenade could be inserted. A grenade could also be inserted into 5-gallon fuel cans on a vehicle. An unattended vehicle could readily receive a grenade in this fashion. A vehicle stopped in urban traffic might experience a distraction from individuals while another slipped in a grenade. Such methods could be countered easily as fuel caps had brackets for padlocks. Another technique was to wedge grenades with pins pulled in the front suspension or against tires of unattended vehicles. When the vehicle moved off, the grenade fell, releasing the lever. A "mud-ball" grenade or mine had a length of wire, several inches long, replacing the arming pin. The grenade was covered with at least 0.5in of clay or thick mud. The grenade was then sun-dried and emplaced on trails, in caches, villages, or anyplace troops might tread. The wire was removed to arm the grenade, but the hardened mud held the lever in place until it was stepped on and the cover was broken. Dried mud, however, might jam the lever. Heavy rains could dissolve the mud and cause such grenades to detonate prematurely.

**Broken branch traps** consisted of a tree limb fallen across a road, arranged so that when a vehicle struck and displaced it a buried charge or mine with a pull-igniter would be detonated. Previously, several un-booby-trapped tree limbs would have been thrown on the road, establishing a repetitive pattern to lull the careless. A more elaborate type involved placing a tree limb on a road or trail which was not booby-trapped, but a pull-firing device was connected by detcord to several buried charges along the road/trail's edge. A lead man removing the tree limb would chain-detonate the charges lining the road, causing casualties throughout the column.

The **anti-helicopter grenade launcher** was a type of device emplaced on potential helicopter LZs. A pattern of four rows of nails was driven into a 2ft-square board. Ten lever-activated fragmentation grenades of virtually any type were set among the nails, which held them in place along with one for each grenade retaining the arming lever. The delay elements of the grenades were retained. Cone-shaped holes, each 2.5ft deep and 2ft in diameter, were dug on an LZ. A 3lb demolition charge – waterproofed, in the event rain filled it – was placed in the hole and tamped with earth within several inches of the hole's lip. The board was placed in the hole, grenades on top, and lightly camouflaged. The number emplaced depended on the LZ's size, but the LZ did not have to be completely covered by the traps as helicopters mostly landed near the clearing's edges. The arming pins were removed from the grenades. The charges were detonated when the approaching helicopters were at an altitude of 300ft. The board would be blown into the sky: the grenades, separated from the board, released the levers at an altitude of 350–450ft and airburst after the grenades' normal delay. Damage could be inflicted on the helicopters, crews, and passengers. Possible LZs were planted with bamboo and hardwood poles 4–20ft in length.

The **helicopter can trap** was an arrangement of four stakes driven in the ground on an LZ in an "X" pattern some 50ft apart. A can in which a grenade was inserted was secured horizontally on each stake, each arranged so the can would hold the lever in place once the pin was pulled. Tripwires ran from each can to the two adjacent cans. The tripwires were taut enough to keep them off the ground. When a helicopter landed, its skids would press on the tripwires, thereby pulling the grenades out of the cans. The grenades might or might not have a delay element. Even if the landing helicopter missed the tripwires, off-loading infantry might trip the grenades.

The **cigarette-pack antipersonnel device** is an example of many types of sabotage-style booby traps designed to catch the unwary (others included fountain pens and cigarette lighters). A metal container filled with C-4 or TNT and ball bearings was placed inside what appeared to be a legitimate cigarette pack, and an acid delay fuze and booster charge were hidden inside. The pack was left in a conspicuous spot to be picked up by a soldier and it would eventually detonate. Troops were told that no attempt to disarm such devices should be made; instead they should be placed under sandbags and allowed to detonate.

In a VC base camp the author found an M72 LAW booby trap consisting of a Soviet VPF pull-type mechanical firing device (similar to the US M1 pull firing device) with its tripwire stretched across a bunker's entrance inside a trench. A length of detcord was fastened to the firing device's blasting cap and ran, buried in the ground, to a tree some 50ft beyond the bunker's entrance. The detcord ran up the tree trunk to a camouflaged LAW set in a crook of a tree limb about 10ft off the ground; the LAW was aimed at the entrance. The detcord was inserted in the LAW's flash tube, allowing it to be fired at the entrance where troops might collect as the bunker was searched and an entering intruder tripped the wire. Captured 3.5in-bazooka rockets in their packing tubes were used in a similar manner.

Crudely manufactured grenades like these could be incorporated into booby traps, mainly activated by a pull tripwire. At left is a root-beer can, probably with gravel or nails packed in a layer around the explosive charge. The device at center is a 2in-diameter length of black-painted steel pipe filled with explosives. On the right is a 500g (1.1lb) explosive charge prepared as a blast grenade and covered with woven palm stripes as a protecting cover. The other two contain approximately 0.5lb charges. All three are fitted with friction igniters, which were very susceptible to moisture. (Tom Laemlein/Armor Plate Press)

# THE MILITARY USE OF BOOBYTRAPS

Booby traps are mainly defensive weapons. Forces employing them are usually on the defensive or in some form of retrograde (withdrawing, retreating, routed), i.e. armies *in extremis*. They leave booby traps behind to harass, delay, and demoralize an advancing enemy. Booby traps are also emplaced to protect defensive positions, provide early warning of the enemy's approach, hamper his attempts to breach obstacles, hinder his advance on specific routes, or delay the use of captured equipment or material. Booby traps can be employed as early-warning devices by emplacing them within obstacles or in avenues of approach into friendly positions. Examples of these include trip-wired grenades or other explosive devices integrated into barbed wire or roadblocks. Booby traps may be employed offensively to some degree in that they can be left behind in enemy territory by a raiding force or reconnaissance patrol. In Vietnam, they were useful for emplacing on supply routes along with mines.

Booby traps do not win battles and seldom had a major impact on tactical events in Vietnam except at the most localized levels. If employed, however, in abundance, with variety and imagination they could delay the enemy and instill a heightened degree of caution and uncertainty. They could also canalize the enemy into areas covered by fire in a manner similar to minefields and other obstacles. The time, effort, and resources needed to effectively sow enough booby traps to have even a moderate impact were substantial, however. Their main contribution was their potential for adversely affecting the enemy's morale and slowing him down. They were very much psychological weapons intended not only to inflict casualties, but to increase psychological stress on combat troops. The maiming effect of booby traps had significant impact owing to puncture and fragmentation wounds and the shredding and burn effects of close-proximity HE detonations, to say nothing of loss of hands, feet, and limbs. On the other hand, once their presence was known or suspected, it led to heightened alertness and they could often be easily detected. Commands would conduct schools to teach selected troops how to detect and neutralize booby traps and they would pass this on to their units.

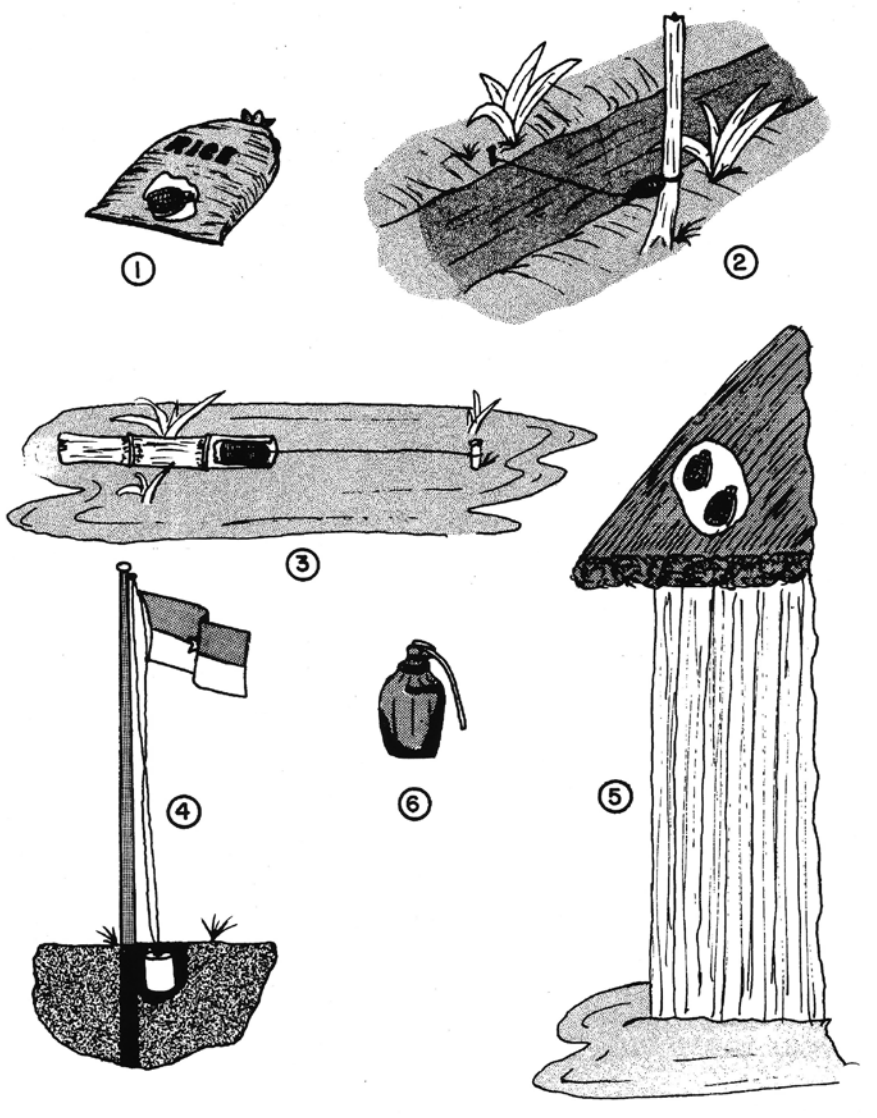
There were seldom defined minefields in the conventional sense. Mines were laid individually, in small clusters, or randomly scattered through small areas – "nuisance mining." Booby traps were often encountered 50–100m (55–109yd) from enemy base camps over an area of perhaps 20–30ft in depth. These distances varied widely. Mines buried within 14in of the surface could usually be detected by mine detectors, but those buried deeper might be missed. This of course varied depending on the soil type, density, and water saturation.

The types and extent of booby traps varied greatly over time and in different areas. Even camouflage methods and detonation systems varied. There was no standardization. One division in III Corps Tactical Zone reported the main types of booby traps encountered were: first, grenades with tripwires; second, multiple trigger pressure type using various types of ordnance; third, ChiCom and large homemade Claymores; fourth, US dud artillery rounds with VC-made fuzes; fifth, wooden homemade box mines with multiple tripwires; and sixth, "toe-poppers" using .50-caliber, 20mm, and smaller rounds. (The only 20mm guns in the US inventory were on

An M14-armed rifleman of 2d Battalion, 4th Marines cautiously makes his way through a sand dune ravine full of different sized punji stakes, 1966. Exposed punji-stake fields such as this were a hazard to troops moving through them when receiving mortar fire as they prevented the troops from "hitting the dirt." (NARA 127-N-A186578/ Wikimedia/Public Domain)

riverine assault craft, in jet fighters, and occasionally on helicopters. There were few opportunities to capture 20mm rounds so their use was scarce.) These were sowed in the hundreds. Later, more dud cluster-bomb units (bomblets) were encountered in large numbers.

Both the PAVN and VC possessed reconnaissance-commando units, the Special Attack Corps (*Bo Tu Linh Dac Cóng*). These troops were known as "sappers" or "zappers" – a play on "sappers" and "zap" – to kill. "Sappers" originated in 17th-century Europe as assault engineers who dug "saps" – approach trenches when attacking fortresses. The Americans chose the "sapper" term as a simple identifying name. VC/PAVN sappers were selected for military proficiency and political reliability. Training ranged from bare basics to quite an advanced level. The sappers' primary tasks were to infiltrate through barbed-wire barriers clearing paths for follow-on assault troops. This included disarming Free World booby traps, Claymores, and trip flares. Entering the base, they swiftly attacked key targets with satchel charges and grenades, what they called "going for the guts." They were essentially the VC/PAVN's precision artillery. Sappers were known for effective reconnaissance, detailed planning and coordination, and realistic rehearsals. They were noted for achieving surprise and inflicting violent action once initiating an attack. Secondary missions included reconnaissance and security patrols, gathering intelligence, keeping Free World installations




These simple illustrations are from *VC Improvised Explosive Mines and Booby Traps* (Department of the Army 1966c). A grenade has been hidden under a rice bag with the pin removed (**1**); when the bag is lifted the grenade would detonate. (Rice captured by Free World forces was turned over to South Vietnamese authorities for redistribution.) A small antipersonnel mine or grenade has been rigged with a cross-trail tripwire secured to a stake (**2**). A grenade was inserted in a wide-diameter segment of bamboo with the pin removed (**3**) and anchored; a tripwire was secured to the grenade in the bamboo and the other end fastened to a stake. The wire tripped and pulled the grenade out to detonate. A grenade or antipersonnel mine could be attached to the lanyard of an enemy flag (**4**); the lanyard would be attached to a pull detonator and the device would be activated when an attempt was made to lower the flag. Grenades could be hidden in a thatch roof (**5**) with string or rubber bands holding the arming lever and the pin removed; the grenades would detonate when the thatch roof was set afire by Free World forces. VC/PAVN forces sometimes removed the delay element from a Free World grenade (**6**) and left it lying where troops would find it, thinking it had been dropped by accident; the pin would be pulled and the lever released to detonate instantly when thrown. (US Army)

under surveillance, and making maps of targeted objectives. They also made their own explosive devices, satchel charges, mines, and booby traps. Often, they were the ones emplacing booby traps and mines to protect their bases as well as on trails and roads used by Free World forces.

## Searching for booby traps

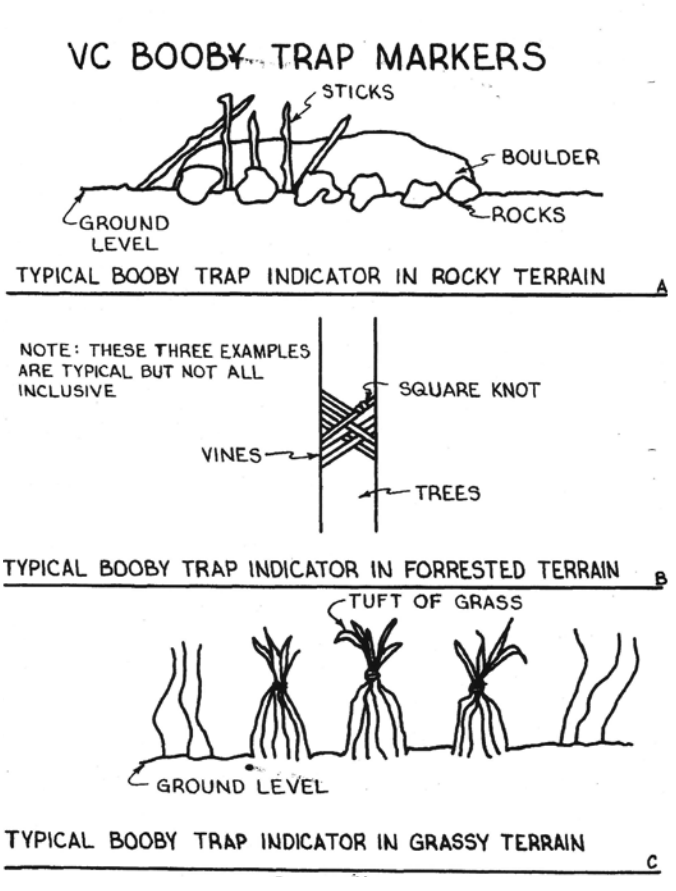
The search for and detection of booby traps demanded a high degree of alertness and situational awareness as well as mindfulness of surroundings. Troops were encouraged to be on the lookout for anything unusual, out of place, or unnatural. On the other hand, booby traps might be disguised as something normal, even something expected to be present like farmer's tools or roadside trash. The following booby trap and mine detection techniques were recommended.

Troops were encouraged to be especially alert for tripwires across trails, along the sides of roads (to catch troops dismounting from ambushed vehicles), across the most accessible routes through denser vegetation, the

approaches to and within villages, on or around helicopter landing zones, approaches to enemy base camps and positions, near bridges and fords, and on rice paddy dikes.

Most firebases had one entrance, making it predictable where security patrols would exit and go into the brush. It was also predictable where they would return, and therefore booby traps and mines might be planted. These were likely areas to place items such as apparently "dropped" booby-trapped grenades or radio batteries. An inexperienced or inattentive soldier might pick it up thinking it had been dropped by a comrade.

Troops were encouraged to be alert for any type of markings possibly alerting the enemy as to the presence of booby traps and mines such as mud smears, unusual stick or pebble patterns, knotted grass tufts, oddly shaped designs made of vines, and markings on trees or large roots. As they were so varied and in unexpected places they were difficult to discern. While their meaning might not be able to be determined, troops finding such signs were enjoined to alert their comrades. Marker signs in the conventional sense were never seen.




The VC used a wide variety of means of warning their personnel of the presence, and marking the location of, booby traps. There were no standardized means, only local practices, and these may have changed occasionally. Besides sticks, rocks, and tied tufts of grass or weeds, marks on the ground, and cuts or other marks on trees were used. Typically, not only did they warn of the presence of booby traps, but also indicated the direction and sometimes the distance to them. These examples are from *Salient Lessons Learned* (Department of the Army 1967). (US Army)

Fresh signs of work along roads such as filled potholes, asphalt road patches, ditch clearing, and culvert work were to be examined. When the VC laid mines over steel culverts they could not be discovered by mine detectors. When potholes were filled, engineers drizzled swirls of oil on the filled hole to make it easier to detect any subsequent tampering.

Tire and skid marks, roadside trash, and ruts could conceal mines. Mines could be buried in water-filled ruts, low spots, and mud holes.

Debris scattered on roads could also conceal mines. This included truck-crushed wooden ammunition crates, flattened ammunition cans, pasteboard C-ration cases, pallets, other discarded military packaging materials, mud, and even water-buffalo droppings.

Troops were encouraged to look for discarded grenade packaging, arming and safety pins and rings, and tripwire spools.

Fallen trees and limbs on trails could be booby-trapped, awaiting someone to drag them clear. Uprooted, cut, or wilting vegetation might indicate mine-laying, though this was not always carried off. The stumps of cut brush could be grayish when dried or smeared with mud to make it less conspicuous.

Troops were enjoined to look for wires leading away from roadsides and ditches. Such wires could indicate command-detonated mines. Such wires might be partly buried, laid in dense vegetation, or smeared with mud.

Personnel were encouraged to be alert for the presence of suspicious items in trees or brush adjacent to roads and trails. They could be booby traps or

command-detonated mines. Such mines were not necessarily located on/in the ground, but could be placed in trees to provide an airburst.

"Tank busts" – winding paths cleared by dozer-tanks and trails through forests – might be mined in the expectation that other units might use the trails. Claymores or other explosive charges might be set 8–10ft off the ground, level with the top decks of APCs and tanks, to blast off troops riding on top, a common practice.

Troops were enjoined to look for deteriorated camouflage (wilting leaves and vines, long-dried dead wood) indicating old booby traps. Rain could wash away covering soil or the earth topping might have sunken creating a small depression or exposed part of the mine. Fresh earth-covered mines and traps could appear unnatural, being hand-smoothed or uniformly shaped low mounds.

Camouflaging covers for booby traps and punji stake pits made of lattice-like covers of sticks, vines, and leaves quickly deteriorated in hard rains. (In fact, heavy rains and the harsh climate quickly deteriorated booby traps themselves when made of delicate materials, and sticks and vines.) Any metal containing iron will rust (oxidize) and non-rusting (non-ferrous) metals and alloys may corrode.

Caution was used on roadblocks. They might be erected simply to slow a convoy, to ambush it, or hit it with harassing fire. They were all checked for booby traps. Dummy booby traps and tripwires might be emplaced and live mines placed around them. Sometimes a series of two or more similar barricades were constructed on a road and might require two or more engineer teams to clear them. One of the later barricades might be booby-trapped to surprise a clearing crew. Once dismantled, logs, limbs, and boards were burned so they could not be reused.

Personnel were encouraged to note the attitude and activities of civilians. If they were friendly and interacted with passing troops and vehicles, the area was probably clear of booby traps. This was especially true if children

**E**

**VC BOOBY TRAPS IN AND AROUND A BASE CAMP**

VC/PAVN base camps varied greatly in shape, layout, and size depending on the terrain, vegetation, and the size of unit. They were usually established in clusters of several camps within a few hours' walk of other clusters. Often if a Free World force approached, the VC/PAVN personnel quietly withdrew rather than becoming engaged and possibly trapped, thereby losing significant casualties and supplies. Some booby traps would be placed on the approaches used by Free World forces, mainly to delay them and warn the occupants of their approach. Others would be located just outside the perimeter to impose further delay.

Booby traps would be prepared to be emplaced when VC/PAVN forces were alerted to the enemy's approach. Some would be pre-emplaced and were activated by stringing the tripwires. Others were stowed to be quickly emplaced by designated men, especially in the direction from which the enemy approached. It was important for all fighters to know where booby traps were emplaced to avoid friendly casualties.

This example of a platoon base camp shows more booby traps than would likely be emplaced. The perimeter ovals denote two- or three-man fighting bunkers; the clusters of small circles around trails and at the village center are spider holes or foxholes; the house-like structures are multi-man covered sleeping platforms; and brown lines are trails. Boxed letters indicate the location of the command post (**C**), a kitchen (**K**), supplies/rations (**S**), ammunition (**A**), a latrine (**L**), and a trash pit (**T**). Circled numbers indicate the location of booby traps in various combinations, including: a spike log (mace) over a trail (**1**); two punji pits several meters apart (**2**), on both sides of a trail (**3**), in conjunction with a punji pit (**4**), or in water alongside a trip-wired grenade (**5**), or a trip-wired grenade and a spike board (**6**); and trip-wired grenades placed singly (**7**), in pairs (**8**), concealed in a thatch roof (**9**), under a cart (**10**), in conjunction with pressure-release grenades (**11**), or in the gas tank of an abandoned or knocked-out vehicle (**12**). There were several types of fuel-tank booby traps; here, in expectation of a Free World patrol investigating the vehicle, adhesive, cellulose, masking tape, or rubber bands have been wrapped around a grenade and the arming pin pulled before the grenade was inserted into the vehicle's fuel filler opening. Different types of tape varied in the time taken to dissolve and detonate the grenade. Bear traps (**13**) previously used for game trapping could also be employed. Sizes varied, with the example shown here being 24in end-to-end; its ankle-breaking spike-toothed jaws are 1ft across. Others were larger. The chain could be anchored to a tree or stake.

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**ABOVE LEFT**
The vast tunnel complexes in the Cu Chi area were essential to the local VC strategy as they hid VC personnel and their civilian sympathizers, munitions, supplies, and support faculties (command centers, workshops, hospitals, kitchens, etc). This camouflaged tunnel entrance (a modern-day restoration) has the entryway's floor studded with punji stakes. There would often be at least one more booby trap, possibly explosive, inside the tunnel. Of course, the challenge for the VC was to ensure that all their personnel were fully versed on the location, functioning, and activation of the traps. There would usually be a man or two responsible for each entrance and maintaining its camouflage and booby traps. (Jorge Láscar/ Wikimedia/CC BY 2.0)

**ABOVE RIGHT**
Termite mounds might be used to site observers, tunnel air vents, caches, and even fighting positions. This is a moderately sized mound and they could be much larger. Troops were taught to examine termite mounds closely, especially those near trails and villages. They could be booby-trapped, though, usually some distance inside. Often a couple of grenades were tossed inside to drive away or flush out any occupants. (shankar s./Wikimedia/CC BY 2.0)

were present. It was probably dangerous if only serious-faced young men were present. If villages were booby-trapped there would be few, if any, civilians present. Flags, banners, and posters could be booby-trapped in expectation of them being torn down, whether ARVN or VC.

If civilians were present and stayed in their hooches, walked to the sides of roads and trails, or stayed in road centerlines, there were probably booby traps in the area. Civilians often told troops where booby traps and mines were located if treated decently and asked politely. Many booby traps were reported by children, who also turned in weapons and munitions they found. The Volunteer Informant Program (VIP) allocated modest funds to field units to provide immediate payment to civilians providing intelligence information and the locations of mines, booby traps, and caches. In one area, 98 percent of the 190 munition items turned in by civilians could have been used in booby traps.

Another asset was available in the form of the KC (Kit Carson Scouts) – VC defectors (*Hồi Chánh Viên*) integrated into US Marine units since 1966 and by the Army from 1967. The program proved successful, with the KCs serving as scouts, pointmen, guides, and interpreters. They discovered a great many booby traps, being familiar with them and recognizing signs. In one instance, in April 1968, KCs of the 9th Infantry Division detected 33 booby traps and three command-detonated mines.

Bodies, both friendly and enemy, could be hastily booby-trapped, usually with grenades. Freshly dug graves might also be booby-trapped. Friendly forces would dig up enemy graves to confirm body counts and retrieve weapons and equipment of casualties, often buried in phony graves to be recovered later.

VC caches of food, supplies, ammunition, etc. were often booby-trapped to include their approaches. Booby-trapped structure entrances additionally concealed caches and personnel hiding spots, or entrances to tunnels. Civilians avoided such buildings. It was recommended that only one man at a time search caches to reduce casualties if a device was detonated.

Trails at stream crossings could be booby-trapped within the stream, its banks, and the approaches. Trash dumps outside of firebases might be booby-trapped, especially targeting bulldozers and front-loaders cleaning up. If no civilian scroungers were working a dump, then there were probably booby traps.

## Detection techniques

Besides actively searching for mines, booby traps, and their signs, troops were alert for the faint sound of a grenade's firing caps popping or the lever's ping. They knew they had a few seconds to shout "hit the dirt" and seek cover, preferably with the helmeted head toward the booby trap and face protected by folded arms. The wearing of sunglasses was discouraged as they reduced the ability to detect tripwires and camouflaging efforts. (It was discounted that glare reduction often helped troops detect tripwires and out-of-place objects.)

By habit troops avoided trails, walking to the sides when approaching villages and possible enemy positions. Trail-sides might also be booby-trapped, however, demanding extra precautions.

A little-used means of detecting tripwires low to the ground was for the pointman to tie 3ft of monofilament fishing line to the rifle's flash hider. An empty 5.56mm cartridge case was tied on the line's end. The slowly moving pointman held the rifle leveled before him, keeping an eye on the cartridge case for it to snag on a tripwire, without activating the booby trap. Bamboo sticks were also used, sometimes a pebble or small piece of metal to be easily discarded if engaged. This method was only useful on well-cleared trails and impractical if there were vines, twigs, and weeds. Such practices were usually only undertaken when approaching villages and suspected base camps and positions.

Mines might be probed for, but bayonets were discouraged as the blade's contact with an electrical or pressure fuze could detonate it. Bayonets and knives were used, however, as such detonations were rare. It also required a man to probe on his hands and knees, a tiring activity. Pointed steel rods – approximately 3ft long and 0.25in in diameter – were sometimes used, allowing a man to walk upright. Rifle-cleaning rods were also used along with sharpened wooden or bamboo sticks.

As mine detectors swept the road and ditches, other engineers with brush hooks might cut furrows parallel with the road, hoping to cut firing wires when road mines were discovered. Steel rods with a hook bent on the end were forced into loose soil and drawn toward the user. The wires were usually covered with loose dirt and not buried by digging.

Desirable items, souvenirs (e.g. pistols or binoculars), and apparently discarded weapons from either side were examined particularly closely. Discarded enemy or friendly munitions, especially grenades, which appeared to be lost by Americans, were not to be picked up for reuse.

Discovered mines and booby traps could be marked with triangular metal markers: red with white MINES or BOOBY TRAPS, and a horizontal white bar. These were seldom used and marked instead with a stick, maybe with a C-ration can topping it, a short length of non-adhesive 2in white fabric engineer tape, or simply a page torn from a notepad. In a village or place where troops were gathering, a man might be detailed to remain with the trap to warn others until it was neutralized.

Explosive-detecting dogs ("bomb sniffers") were not yet in use, but scout dogs could detect the scent of a person who emplaced devices. One problem with dogs was that they lacked stamina and became worn out in three days. The scent might linger for up to four days depending on dryness, rain, dew, and winds. A scout-dog platoon leader once estimated that 75–90 percent of recent booby traps were detected by dogs – probably exaggerated. Dogs could not be effectively evaluated as their individual detection abilities

U.S. FUZES
USED TO SET OFF ANTIPERSONNEL MINES AND BOOBY TRAPS
RELEASE
PRESSURE
PULL
TYPE
LATCH
STANDARD BASE
SAFETY PIN
SAFETY NAIL
PRESSURE CAP
SAFETY CLIP
CASE
POSITIVE SAFETY PIN
STANDARD BASE
PULL RING
HEAD SAFETY-PIN HOLE
ANCHOR CORD
POSITIVE SAFETY-PIN HOLE
STANDARD BASE
ACTION
1 REMOVAL OF LOAD (MINIMUM 2 LB.) FROM LATCH RELEASES LEVER
2 LEVER SWINGS DOWNWARD AND STRIKES PIN
3 FIRING PIN SETS OFF PERCUSSION CAP
4 CAP DETONATES ATTACHED BLASTING CAP WHICH FIRES CHARGE
1 PRESSURE OF 20 OR MORE LB. ON PRESSURE CAP DEPRESSES TRIGGER PIN
2 ENLARGED PART OF KEYHOLE SLOT RELEASES STRIKER
3 STRIKER SETS OFF PERCUSSION CAP
4 CAP DETONATES ATTACHED BLASTING CAP WHICH FIRES CHARGE
1 PULL OF 3 TO 5 LB. DRAWS RELEASE PIN OUT OF SPLIT HEAD OF STRIKER
2 SPLIT HEAD COMPRESSES AND SLIPS THROUGH COLLAR
3 RELEASED STRIKER SETS OFF PERCUSSION CAP
4 CAP FIRES EITHER ATTACHED BLASTING CAP OR AN IGNITER IF USED WITH M2A1 ANTI-PERSONNEL MINE
USE
ANTITANK MINE
TNT
RELEASE FUZE
ONE BLOCK TNT
BOOBY-TRAPPED ANTITANK MINE
PRESSURE FUZE
ONE BLOCK TNT
PRESSURE FUZE WITH IMPROVISED ANTIPERSONNEL MINE
PULL FUZE
TRIP WIRE
HAND GRENADE
PULL FUZE WITH HAND GRENADE
HOLE IS CUT IN FLOOR AND COVERED WITH PIECE OF PAPER
HOLE IS CUT IN FLOOR AND COVERED WITH DOOR MAT
PULL FUZE IS ACTUATED WHEN TRUCK IS MOVED

varied. As an example, however, 9th Infantry Division dogs detected almost 200 booby traps in the first half of 1968.

Training for booby-trap detection was rather limited. Infantrymen, armored cavalry scouts, and combat engineers only received a few hours of instruction during advanced individual training in types of traps, identification, and likely hiding places for booby traps. Most VC booby traps demonstrated were punji stakes and a few explosive types were demonstrated employing US firing devices that would activate colored smoke and CS grenades to represent HE charges. This was usually conducted within Vietnamese village mockups. In Vietnam, booby-trap reaction courses were part of mandatory divisional and separate brigade combat-orientation courses, but lasted only two or three hours. The troops' real training was within their units when new personnel were "buddied-up" with experienced men in the field.

Troops were always on the lookout for booby traps and their signs no matter where they were. Villages and enemy base camps were especially likely places, however, particularly if civilians were absent. Reconnaissance teams within enemy areas were of course on the lookout for traps, but the nature of their missions caused them to avoid trails and anything with human activity other than observing and reporting it. If they discovered booby traps they seldom attempted to mark them, remove their camouflage, or neutralize them, even if friendly troops would enter the area. They could not afford to reveal their presence. Of course, some missions allowed them to mark and remove camouflage, and would at least warn of the presence of booby traps in their spot reports. Reconnaissance teams seldom moved at night as night-vision equipment was in its infancy and the jungle was so dense and dark that silent movement and accurate navigation were impossible. Since they were searching for the enemy, they could count on being in close proximity to booby traps and early-warning devices. Stealthy daylight movement allowed silent motion, accurate navigation, and opportunity to detect the enemy and booby traps.

## Mine detectors

In Vietnam, the US Army used several mine detectors developed during World War II, with mixed success. The most prominent were the AN/PRS-3 "Polly Smith" metallic mine detector, AN/PRS-4 "Uncle Henry" metallic

**OPPOSITE**
This World War II poster illustrates US fuzes used to set off booby traps and antipersonnel mines. Although the threat posed by such devices in Vietnam was understood by senior commanders, training in booby-trap detection was rather limited. The real training began when new personnel arrived with their units in the field. (NARA 44-PA-2202/ Wikimedia/Public Domain)

**FAR LEFT**
Engineers of the 1st Australian Task Force's 1st Field Squadron carefully sweep a road shoulder with an AN/PSS-11 (aka "P-153"). While the detector operator wears body armor, he does not wear a steel helmet as was US practice. The detector operator concentrated on the device's constantly changing tone and his hearing was further restricted by the earphone. The backup man strived to watch his back and alert or warn him of any commands or threats he might not hear. (Tom Laemlein/ Armor Plate Press)

**LEFT**
A US combat engineer practices with an AN/PSS-11 mine detector prior to assignment to a field unit. Having received minimal mine detector training during combat engineer advanced individual training, it was determined additional and more realistic training was necessary in Vietnam. (Tom Laemlein/Armor Plate Press)

The 1967 man-packed 24lb XM2 olfactonic (related to the sense of smell) personnel detector (aka "E63") detected perspiration odor via an air-intake tube mounted under the barrel of an M16A1 rifle. The "people-sniffer" was overly sensitive and could detect the sweat of its operator, and it made a revealing "ticka-ticka-ticka" sound when operating. Once the presence or recent presence of the enemy was detected, Free World troops would be on the lookout for booby traps. (Tom Laemlein/ Armor Plate Press)

and non-metallic mine detector, and the developmental Polan Industries 153 ("P153" – later became AN/PSS-11) metallic mine detector. The various models possessed a two- or three-section handle with the usually square detector head, harness, amplifier, resonator, batteries, and other electronic components packed in footlocker-sized chests.

The operator generally walked upright, slowly sweeping the detector head back and forth 1–2in off the ground. A consistent clearance off the ground was essential or the tones changed and false indications were given. Although handle sections could be removed and the operator move on one hand and his knees, this was extremely difficult and seldom practiced. He wore a headset to listen for tone changes. The electronic impulses varied in tone depending on the density, consistency, and soil moisture levels. Operators were rotated frequently owing to the many difficulties of carrying out such work –the irritation of the constantly changing tone, the high degree of concentration, stress, repetitive back-and-forth sweeping while maintaining a consistent 1–2in above ground. The sensitivity of the tone had to be adjusted before use depending on soil conditions and readjusted as the soil's moisture content changed through the day. The extent of iron in the soil changed too, requiring further adjustment. Reddish laterite soil, rich in iron and aluminum, is common throughout Vietnam. Operators would fine-tune the amplifier using buried metal objects. Mine detectors were not infallible. Assessments of effectiveness determined that engineers required more time in advanced individual training and while preparing for their duties in Vietnam.

The mine-detector operator's situational awareness was impaired by his use of earphones and the detector's tones. He might not hear the pop of a booby trap activating, distant gunfire, and warning shouts. Sometimes a backup man followed with a cord attached to the operator and tugged it to alert him.

Besides metallic mines and objects, detectors designated "non-metallic" could detect non-uniformities such as rocks, roots, and air pockets as small as a 5in cube. It depended greatly on soil conditions and the operator's skill, but mines and non-uniformities could be detected 3–5in deep. Large mines and explosive charges might be detected up to 12in deep. Mines buried

14–18in were seldom detected. Of course, their effectiveness was limited at such a depth and such mines seldom would be detonated by a tank track or truck tire. Instead, they had to be command-detonated.

It was particularly difficult to detect mines buried over steel culverts, as inexperienced operators assumed the return signal was simply the culvert. Encountering such a feature, the sensitivity was adjusted until it picked up the culvert, then the sensitivity was gradually reduced until the culvert was no longer detected, and the area over the culvert slowly swept to detect mines. Additionally, visual searchers checked inside culverts and both its ends for any objects, wires, mud, or disturbed soil.

## Road clearing

It was essential to keep national and provincial highways open to supply Free World bases, for unit movements, and to allow commercial traffic. These routes were typically two-lane asphalt or graded gravel roads with drainage ditches, culverts, bridges, and low-water bypasses. (Low-water bypasses were temporary, unimproved roads placed beside bridges if the banks were low and which could be driven through in the dry season if the main bridge was damaged or destroyed.)

A significant means of protecting roads was to clear-cut the forests on both sides. This was undertaken by engineer units including six land-clearing companies with 30 Caterpillar D7E Rome Plow bulldozers – fitted with heavy-duty, 12ft-wide KGBA7E clearing blades with a tree-splitting spike on the left end – stripping 100–500m-wide (109–547yd-wide) swaths on both sides. This forced the enemy to initiate ambushes outside of effective small-arms range, denied them base camps, limited their movement ability, and made it almost impossible to bury command-detonated mine-firing wires to distant tree lines. Drag chains towed by paired Caterpillar D6B or Allis Chalmers HD-16M dozers flattened small trees, saplings, brush, and bamboo.

The roads were secured by firebases and outposts 8–10km (5–6 miles) apart, determined by terrain and vegetation. This allowed road patrols, ground surveillance radar, aerial surveillance, foot patrols in the adjacent forests, and morning mine-sweeps. Two neighboring bases could fire in support of the base between them and vice versa.

Before morning traffic could be allowed, the road was cleared of mines invariably planted by nocturnal VC. Civilian traffic was held at their originating town by the police, as was military traffic. The mine sweep party set out after sunrise with several two-man mine-detector teams, one man handling the mine detector and the other searching ahead as the visual spotter; two teams operated side-by-side on wide roads. The teams would be relieved frequently owing to strain and concentrating on the mine detector's tone signals. Troops up to a rifle platoon in strength would serve as escort and a couple of engineers with demolitions accompanied the party. A gun jeep or other armed vehicle might also escort them along with a jeep ambulance. The escort spent 20 percent of their time picking up "chaff" (machine-gun links and cartridge cases left by convoys and APC patrols reconnoitering by fire), ammunition cans, ration cans, and other scrap metal that interfered with mine detectors.

VC roadblocks were constructed, especially in hilly areas, with pits and holes, piled dirt, rocks, tree trunks and limbs, logs, scrap lumber, destroyed vehicle debris, etc. These were not necessarily robust as they were only

manmade; the VC did not have access to construction equipment. They might only be lightly constructed with the intent of slowing or briefly halting a convoy to open fire on it, or might be booby-trapped and mined to further delay clearing to include around the barricade. Besides bulldozers clearing roadblocks, Clark 290M four-wheeled articulating tractors with scoops or dozer blades were used – these were more maneuverable and could be driven at greater speeds to work sites.

Engineers or infantrymen usually walked along the flanking shoulder and drainage ditches, and farther out in the Rome-plow searching for firing wires, booby traps and components, disturbed soil, and footprints. Freshly disturbed earth with brushed tracks was suspicious: close inspection usually revealed unnatural brushing and VC efforts to remove tracks by sweeping with leafy tree limbs were readily spotted by vigilant troops.

Troops might carry three- or four-prong grappling hooks to toss over light brush and weeds, and drag them back to snag electrical firing and tripwires. Expedient grappling hooks were made from 175mm and 8in artillery projectile eyebolt shipping plugs removed from the fuze well. Three or four short re-bar hooks would be welded to the plug and a cord tied to the eyebolt to provide a lightweight grappling hook. The sweep party might clear from its firebase to the next, or two parties might strike out in both directions and meet halfway parties from their neighboring bases to speed up the process. It might take 6.5 hours to clear 13km depending on how hilly, or 2km per hour. It was slower in the rainy season. Most engineer unit casualties were suffered on road clearing from mines, booby traps, snipers, and mortaring.

## Manual disarming

It was recommended that only trained specialists should manually disarm booby traps. It was far safer to blow the device in place, if at all possible. Only specialists would inspect and destroy unusual or complicated devices. All camouflaging materials must first be removed and both ends of trip or pull-wires, electrical wires, securing cords and wires, and detonating cords

**ROAD MINES AND BOOBY TRAPS**

While some remote Free World forces bases were resupplied by airlift – a costly means with limitations on the amount of cargo delivered and weather delays – most bases were served by road-bound tractor-trailer and cargo-truck convoys. Besides sniper, machine-gun, recoilless-rifle, RPG, and mortar attacks, pressure- and command-detonated mines were used. The main roads heavily used by military and commercial traffic were prime targets, especially in hilly areas with winding roads upon which convoys had to move more slowly, making them susceptible to ambushes and mines.

Many roads were improved with packed earth, and gravel and mines could be planted and hidden easily. The more important routes were asphalted or at least oiled, making it more difficult to hide mines as such activity would disturb the road surfaces. In such cases command-detonated mines might be emplaced on shoulders (**1**), in bar ditches (**2**) intended for mine-clearers, or – if horizontally detonating (Claymore) – hidden in foliage beyond the ditch (**3**). Firing wires were seldom buried owing to the time and effort, instead being hidden in vegetation. Troops walking parallel to the road threw grappling hooks forward and dragged them back to pull loose trip- and firing wires. Mines could be emplaced in potholes or beneath asphalt repairs (**4**). Charges could be hidden in water or mud-covered culvert bottoms (**5**). Mines were also buried over steel culverts in hopes of fooling magnetic mine detectors (**6**). Simple roadblocks unable to halt a tank or even a truck were booby-trapped to explode when run over or when efforts were made to dismantle it (**7**). A non-booby-trapped crude roadblock farther up the road could serve to divert attention (**8**). An abandoned hooch and approaches could have booby traps (see page 51) to hamper Free World troops (**9**). The fence surrounding the overgrown garden could be booby-trapped, including punji stakes in the vegetation, to catch scrounging ARVN troops.

The insets show a unit-manufactured three-prong grappling hook or grapnel (**10**) made with 0.375in steel rods and 0.5in reinforcing bars (re-bars). OD nylon ropes were usually used. The hook was thrown into the suspected mined area by a soldier from undercover and dragged back, snagging and activating tripwires. With a 36in-long handle and 12in-long blade, the brush hook (**11**) was used to hack lines parallel to roads and cut electrical firing wires.

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must be revealed and their purpose determined. In the event that booby traps must be disarmed to prevent collateral damage, or if something new that needs to be examined, the 1966 *Guide to Selected Viet Cong Equipment and Explosive Devices* (DAPam 381-11) specified:

> Do not touch any part of the booby trap without first examining it thoroughly. Locate all tripwires, firing devices, and their triggering mechanisms.
>
> When tracing wires, look for concealed intermediate devices laid to impede searching. Do not disturb any wires while examining booby traps.
>
> Cut loose tripwires only after careful examination of all connecting objects and after replacing all safeties [pins and locks].
>
> Trace taut wires and disarm all connected firing devices by replacing safeties. Taut wires should be cut only after eliminating the danger at both ends.
>
> Replace safeties in all mechanisms using grenade pins, nails, lengths of wire, or cotter pins.
>
> Never use force in disarming firing devices.
>
> Without disturbing the main charge, cut the detonating cord or other leads between the disarmed firing device and the main charge.
>
> Cut [all] wires leading to an electrical detonator – one at a time.
>
> When using a probe, push it gently into the ground. Stop pushing when you touch any object (it may be a pressure cap or plate.)
>
> Once separated, booby trap components should be removed to a safe storage or disposal area. (Dept of the Army 1966b)

**G**

**BOOBY TRAPS IN A VC VILLAGE**

A variety of booby traps were found in villages and could be of any type and in a variety of locations, some being obvious while others were very difficult to detect. They were typically well camouflaged and it was not uncommon to find traps in places where they had never previously been found. There might be fewer explosive booby traps within villages, but that does not mean they were necessarily scarce. Villagers made every effort to abandon villages when Free World forces approached. Villagers unable to flee were generally passive and stayed away from known booby traps. Sometimes there were simply too many children, women, and elderly villagers present to emplace booby traps. Some villagers would discreetly point them out in an effort to prevent casualties and damage.

In the village illustrated here, a variety of booby traps are depicted. Inside a hooch is a pile of rice bags (**1**) concealing the entrance to a small tunnel. A grenade is positioned so the arming pin is held in place by a rice sack. Moving the sacks would detonate the grenade. Also inside the hooch is a tripwire (**2**), hidden in the interior shadows and stretched across the home to a concealed demolition charge. A grenade is hidden beneath the gate (**3**), which holds the arming lever in place so the grenade is armed when the gate is opened. Large pottery food, grain, and water containers (**4**) were found throughout villages. They were often moved or overturned as troops searched for tunnel entrances. Here, a grenade has been positioned so its arming lever is held in place by a heavy pot.

Posters (**5**) and banners displayed by the VC were habitually ripped down and sometimes found to have a pull-wire affixed to detonate a device in the remover's face. Among three apparently discarded ammunition cans (**6**), one is filled with earth and sitting on a buried grenade from which the arming lever will release if the can is picked up. Three small punji pits in a cluster (**7**) are hidden near the fence. A passing soldier would likely step in one.

The gate (**8**) has a grenade hidden 2–3ft away with a tripwire attached that would activate the grenade when the gate was opened. This made it more difficult to detect the grenade when the gate was inspected. A cloth curtain door opening (**9**) has a grenade hidden above it and connected to a tripwire. Three grenades have been hidden in the eaves of a thatched roof (**10**). The levers are tied with string and the arming pins removed. When a soldier sets the hooch afire, the strings burn off and the grenades detonate. A pivoted spike board (**11**) has been buried and camouflaged with earth. Stepping on the treadle board will force the spike board to pivot up and injure the unsuspecting victim.

Hidden in a small area of light foliage that a soldier might approach are a number of cartridge traps (**12**) that may be stepped on. A spike board with four to six spikes driven into it (**13**) is buried in the mud in a pig pen. Troops would wade into the mud to probe for a tunnel entrance or cache.

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**ABOVE LEFT**
A Marine of 2d Battalion, 4th Marines disarms a PAVN fragmentation grenade. It was hidden among reeds and rigged as a booby trap activated by a tripwire. (Official USMC photo by Corporal L. Preston Brown from the Jonathan F. Abel Collection (COLL/3611) at the Archives Branch, Marine Corps History Division/Wikimedia/ Public Domain)

**ABOVE RIGHT**
Items recovered in a small local cache outside a village include a 15lb Chinese-made antitank mine, a 1kg (2.2lb) TNT charge wrapped in fabric and bound by thin bamboo strips, and some North Vietnamese-made fragmentation stick hand grenades. The grenades used a pull-type friction igniter fuze held in the handle. They were highly susceptible to moisture. (Tom Laemlein/Armor Plate Press)

The most practical means of neutralization was destruction in place using demolitions. It was normally a simple matter, but care was taken if the trap was in a village, near critical structures and facilities, cemeteries, etc. Normally only explosive booby traps and mines were blown in place. A 0.25lb or 0.5lb TNT charge or one-quarter of a 1.25lb M112 C-4 plastic-explosive block was used for small exploding booby traps. For large traps comprised of one or more mortar and artillery projectiles, a larger detonating charge was necessary. The projectile bodies were sometimes too thick to rupture and while one projectile might detonate, others nearby might not necessarily explode through sympathetic detonation. Charges were more assured of detonating on the spot if the demolition charge was placed atop the trap's charge. This required caution as it was necessary to avoid touching the trap while placing the charge. If placed beside the trap's explosive charge it could blow the undetonated charge sideways, possibly toward friendlies. A non-electric blasting cap crimped to a 30–60-second delay fuze was inserted in the TNT charge's fuze well or inserted into a hole punched using the spike handle of a fuze crimper. Personnel were cleared from the area, ideally 50m (57yd), but closer was allowed if there was cover – farther of course if multiple artillery projectiles. The demolition man shouted, "Fire in the hole!" three times and lit the delay fuze with a cigarette lighter, match, or M60 time-fuze ignitor. After debris and secondary fragmentation ceased falling, the site was checked ensuring the trap was completely destroyed and no usable components remained. Any remaining tripwires and firing wires were recovered.

Seldom did infantrymen neutralize mines and booby traps themselves. Instead, two- or three-man EOD teams were called. These might be attached directly to the infantry unit from the divisional engineer battalion or a separate brigade's engineer company. The team might have been with the unit in the field or was helicoptered in. Unless it was a new design the devices were simply destroyed on the spot. There was no sense in trying to disarm an explosive device. Non-explosive or mechanical booby traps were simply destroyed using an e-tool or machete, or physically dismantled. Punji stakes

were broken, and their holes filled in. Those with steel spikes were usually evacuated to base and destroyed there. Its location and description were recorded and in some cases Polaroid photographs taken or a sketch made to add to the report. The data would be turned into S-2 and passed up the intelligence funnel (this was especially true if a new or unusual device). Traps were never bypassed nor abandoned, and some infantry units trained their own teams to blow booby traps and mines.

## Casualties

Vietnam War movies often give the impression that entire vast jungles, mountains, swamps, and plains were liberally sown with all manner of booby traps, making it dangerous to take a step. That is a totally unrealistic impression. Nothing was served by randomly sowing them over the countryside, especially since they deteriorated so rapidly in the harsh climate and required time to maintain. The VC were very selective where they emplaced booby traps. They were found around Free World bases and installations where patrols might be conducted, and on known patrol routes and local trails. They were also emplaced on routes leading into VC/PAVN bases, camps, and villages. Items left in camps might be booby-trapped too. They had to take a great deal of care not to booby trap trails, paths, and cultivated fields where locals traveled and worked. The VC did not wish to anger locals. Free World forces often paid locals disgruntled by the VC/PAVN to guide them into camps and villages. They might not always know where booby traps were, but they knew where they weren't.

The goal of booby traps and mines, besides a remote means of attack, went beyond simply inflicting a relatively small number of casualties. The VC soon understood that simply wounding a soldier had a significant impact on a unit. The unit halted as the casualty was treated and then waited for helicopter evacuation. Repeated casualties could significantly delay a unit's movement and damage morale. It also alerted the VC as to where the unit was, if not by the booby trap's detonation, by the arrival of a medevac helicopter. One example, Company C, 1st Battalion, 20th Infantry, suffered over 40 percent casualties to booby traps and snipers in 20 days and scarcely saw a VC; arguably a rare, extreme example.

The VC themselves did not initially realize how much impact booby traps would have on their opponent's morale and how much it could slow and hamper them, even though they had used them against the French. They also had not realized how much the Free World media made of these insidious devices. It also had an impact on the home front in regards to shaping public perception. The use of booby traps caused the loss of fingers, toes, hands, feet, arms, legs, and eyes. This maiming aspect had a major impact on the perception of the war. Between January 1965 and June 1970, 11 percent of US troops killed in action and 17 percent of those wounded were by booby traps and mines. There were units which suffered higher percentages while others scarcely experienced any. It varied greatly over time, the areas in which they operated, local enemy practices, and the extent of their activity. It is difficult to determine the actual numbers of booby-trap casualties as many were reported as explosion, fragmentation, grenade, or other injuries rather than attributing wounds directly to booby traps.

Owing to this wide variance in categorizing deaths and wounds, which occasionally changed, an accurate count of booby trap and mine casualties is impossible. One study reports 7 percent total lethal booby-trap casualties.

A Marine seriously wounded by a booby trap is comforted by a medical corpsman. Owing to their severity, most booby-trap wounds resulted in troops not returning to action. (NARA 127-N-A704831/Wikimedia/ Public Domain)

This compares to 4 percent lethal booby-trap casualties in both World War II and the Korean War.

The use of booby traps could also affect the force employing them in certain instances, especially if it counterattacked to retake an area (seldom accomplished by the same unit that originally occupied the ground and emplaced the booby traps); it could create adverse public opinion, or cause casualties among friendly or neutral civilians still in the area. Their own patrols and raids into areas previously occupied by their own forces might also have encountered these booby traps. A booby trap causing a man injury limited unit mobility and firepower: two or more men might be necessary to aide or carry an injured man until he could be medevaced.

# FREE WORLD FORCES' MINES AND BOOBY TRAPS

Free World forces also made use of booby traps, but in a different manner and on a much smaller scale. Because of reporting requirements and the available means of land navigation at the time – there was no GPS – booby traps were seldom emplaced in enemy-controlled areas and never in friendly areas. For example, emplacing booby traps in remote unoccupied enemy base camps and on trails was seldom undertaken because of the risk of fratricide posed to friendly units or civilians. It was required to report their location with an eight-digit grid coordinate – i.e. to the nearest 10m (33ft). Dead-reckoning navigation and terrain association were not sufficiently accurate means to pinpoint and recover a well-camouflaged booby trap or buried mine within a 20m (66ft) radius if its placement was that accurate.

## Installation defense

Free World booby traps and mines were mainly set within barbed-wire barriers to hamper infiltrators and provide early warning of their penetration. These included trip-wired hand grenades, trip flares, and command-detonated or trip-wired horizontally firing Claymore antipersonnel mines. Buried antipersonnel landmines were little used as they were dangerous to recover from within wire barriers and potentially hazardous to brush- and weed-clearing details. Booby-trapped grenades and Claymores were also used by small teams operating in enemy territory to hamper enemy pursuers and protect their overnight positions. Claymores, both command-detonated and trip-wired, were widely used in ambushes. Not being buried, they could more readily be recovered when the emplacing unit departed.

**Barbed-wire barriers** surrounding Free World installations were extensive and varied. The amount of wire and the extent of construction depended on a variety of factors including the installation's permanence, duration of a temporary base's establishment, terrain, vegetation, water obstacles, enemy avenues of approach, adjacent roads and trails, and possible enemy supporting weapons locations. The slope of the terrain was important, be it level or steeply sloped. The barrier could consist of as little as a single coil of concertina wire stretched around a temporary firebase to a couple of rolls of stacked concertina, or as many as a dozen belts of double-stacked concertina, cattle fences, and apron fences. The amount of wire, labor, and available time were important factors. While manuals provided standard designs, there were significant and imaginative variations. A common mistake was to stretch wire barriers taut, making them easier to climb. Loose wire was more difficult to traverse. Free World booby traps, trip flares, and Claymores were emplaced within these barriers to hamper infiltrators and assault troops. Booby traps and trip flares might be placed on the outer edge of the perimeter wire to aid early detection, but most of the time they were positioned deeper inside the wire to make it more difficult for the enemy to disarm them. Trip-wired WP and CS grenades were not emplaced inside the wire as WP smoke screened the enemy and the CS could drift into the camp and affect friendly troops – protective masks were scarce.

"Tanglefoot low-wire entanglements" were sometimes emplaced between barbed-wire belts to hamper low-crawling infiltrators and to slow and trip

**ABOVE LEFT**
The US M49A1 surface trip flare was used as an early warning device to alert defenders if the enemy was infiltrating though perimeter barriers or attempting to approach night defensive positions. This example, courtesy of Trey Moore, is rigged with its mounting bracket and safety clip. The trigger does not have a tripwire attached. It had an instantly activated igniter with zero delay. With the bracket removed, however, the arming lever held in place, and the arming pin removed, it could be hand thrown and ignited as it was let go and the lever flew off. (Author)

**ABOVE RIGHT**
Two methods of attaching rattle traps to barbed-wire barriers for the detection of infiltrators. The left-hand example is hung by a bent lid which remains attached to the can. The can on the right is nail-punched with two holes and wire-tied to the barbed wire. Both would have pebbles or empty cartridge cases inside to rattle when disturbed. (Author)

charging attackers. Web-like patterns of taut or loose wire were strung between barrier-wire pickets and short stakes. Wire could be strung in lines, crisscrossed, or diamond-shaped patterns. Tanglefoot was strung 9–30in above ground. Small loops were sometimes incorporated to snag running feet. Trip flares, Claymore tripwires, and other tripwire-activated booby traps were incorporated into tanglefoot, making it difficult to locate the tripwires.

After arriving at Chi Linh Special Forces Camp in 1969 the author was checking the Claymores within the barrier wire. Among the tanglefoot wire strung between the stacked concertina belts he found scores of randomly scattered "barbed-wire squares." These consisted of four 18–24in lengths of barbed wire twisted together in a square with the crossed ends extending a few inches beyond the corners. Four more lengths of wire were then added: two bisected the square halfway along the edge and two were strung diagonally from corner to corner. The different wire strands were twisted together at the corners. These barbed-wire squares were scattered about the ground, especially around Claymore mines and trip flares, making it more difficult to neutralize the mines and flares by hampering low-crawling infiltrators, who often wore only shorts and sometimes went barefoot. How effective such squares were is unknown. With repeated rains and a prevalence of surface mud, some of them were partly submerged in dried mud. The author has never read of these in any publication or heard of them being used elsewhere, though in all probability they were.

Some early Special Forces camps were surrounded by **moats**, typically no more than 8ft wide and deep. They were usually dug just outside the perimeter defense line and within grenade range. Most had sloped sides with a flat bottom, but some were V-shaped and liberally planted both in the bottoms and sides with punji stakes. They were only filled with water during the wet season or in the Delta with its high water table. Use of such moats was later discontinued as it was realized that they provided attackers with cover, even if filled with concertina wire, punjis, and booby-trapped grenades. Moats were also found to be difficult to maintain, unsanitary, and likely to breed mosquitoes.

Sometimes ditches were used to drain camps and bases as well as being dug around the exterior perimeter. These would be filled with concertina wire, punjis, Claymores, and booby-trapped grenades. Some camps/bases were adjacent to canals and rivers, which additionally served as "moats." Canals and rivers could not be blocked by concertina or other obstacles because doing so would hamper sampan traffic and snag floating debris. Their banks, often both sides, would be barb-wired.

A combination of infiltrator-cut wire, picket stakes, and wire blasted and uprooted by the attacker's and defender's mortars and recoilless rifles created tangled obstacles. The use of Claymores (including ChiCom models) and hurled demolition charges may have opened gaps for attackers, but also resulted in more tangled obstacle debris demanding further cutting and clearance. Mortar and artillery rounds with super-quick fuzes left virtually no craters on hardened dry surfaces, but did tear up the wire and pickets.

**Rattle traps** date from World War I or even earlier. In Vietnam they consisted of tin cans – usually larger C-ration cans – attached to tripwires, tanglefoot, concertina wire, or any strand in a wire barrier. If the can lid had been removed, two holes were punched below the lip 0.5–0.75in apart and a wire loop threaded through them and attached to a wire strand. Alternatively, the lid was left attached by 1–1.5in of the lid's edge, the lid bent halfway across, and the can hung on the wire. Mud could be smeared on cans to prevent glint. A few small pebbles or empty cartridge cases were placed in the can as rattles – not too much or the weight would reduce the rattling noise. A few small holes were punched in the can's bottom to drain rainwater. Rattle traps were periodically inspected to remove blown leaves and mud was reapplied. Wind could rattle the cans, especially when brushes were blown against the wire, and wildlife could trip them.

The **M49A1 surface trip flare** was widely used as an early warning device in barbed wire and on enemy routes of approach. Units ranging from small reconnaissance teams to companies would set them up around their night position. It consisted of the magnesium-filled 1.3×4.8in canister with the firing lever, pull pin, and safety clip fitted to the top cover. The trigger, arming lever, and trigger release were integral to the large mounting bracket. It had two-nail-hole tabs and two wingnut bolts to hold the canister in the bracket. The bracket was necessary to rig the flare with the tripwire trigger, which had to be clamped or nailed to a tree or stake. Too noisy to covertly install, the bracket was often discarded, the U-shaped safety clip removed, the tripwire fastened directly to the pull pin, and run up to 40ft to the right to an anchor. By holding down the arming lever the safety pin could be removed and reinserted to allow it to be pulled from the left. When tripped the flare immediately ignited to burn for 55–70 seconds, illuminating up to an area with a radius of 300m (328yd) with 35,000 candlepower. Burning at 4,000°F, a flare could start a brushfire. It alerted that the enemy was infiltrating, illuminated them, and temporarily blinded or dazzled them; it could also dazzle friendly troops, however. It is interesting to note that in US Army publications M49A1 installation instructions used World War II M49 illustrations, which was designed and installed much differently. This led to confusion and incorrect installation.

## Claymore mines

The M18A1 antipersonnel mine was an above-ground, horizontally fired weapon widely used for ambushes, booby-trapping, and perimeter defense. It consisted of a convex-shaped gray-green fiberglass-polystyrene (plastic) case measuring 8.5×3.25×1.38in and containing 1.5lb of C-4 faced with 704 0.22in steel ball bearings embedded in an epoxy matrix. The case's front was marked FRONT TOWARD ENEMY, with BACK marked on the other side. On top were an aiming sight and a pair of detonator wells. Two metal folding scissor legs were on the bottom, making the mine 6.75in high with legs opened. Each mine was issued in a two-pocket M7 bandoleer with a

### Where did the idea for the Claymore mine come from?

Germany developed a small tripwire-activated, cone-shaped, directional, antipersonnel fragmentation mine late in World War II. Reportedly it was intended for emplacement on concentration-camp fences. It did not see wartime use, but East Germany further developed it as the SM-70 (Schützenmine 1970), emplacing it on border barrier fences in the early 1970s. France produced a directional antipersonnel mine in 1947; details are unavailable. The Chinese "human-wave" attacks experienced by UN forces in Korea led to the US-developed M18 Claymore mine in 1958. A much-improved model, the M18A1, was fielded in 1960 and widely used in Vietnam from 1964. The Claymore's name is derived from the Scottish double-edged broadsword. Both weapons are capable of cutting a wide swath through the enemy. "Claymore" is the Anglicized version of the ancient Scottish Gaelic term for "great sword," *claidheamh mòr*. Around 80,000 M18A1s were produced per month from 1965 to the war's end.

100ft spool of electrical firing wire fitted with an M4 blasting cap and a hand-activated M57 electrical firing device ("clacker"). In every case of six mines an M40 electrical circuit test set was provided.

Claymores were devastating weapons with the detonation of 1.5lb of C-4 – more than an 81mm mortar round's filler – blasting 704 .22-caliber ball bearings into the enemy at 4,000ft/sec (1,219m/sec). At close range the Claymore's detonation shredded and dismembered individuals, and weapons and equipment were destroyed. They could blast wide openings through wire entanglements, and disable soft-skin vehicles.

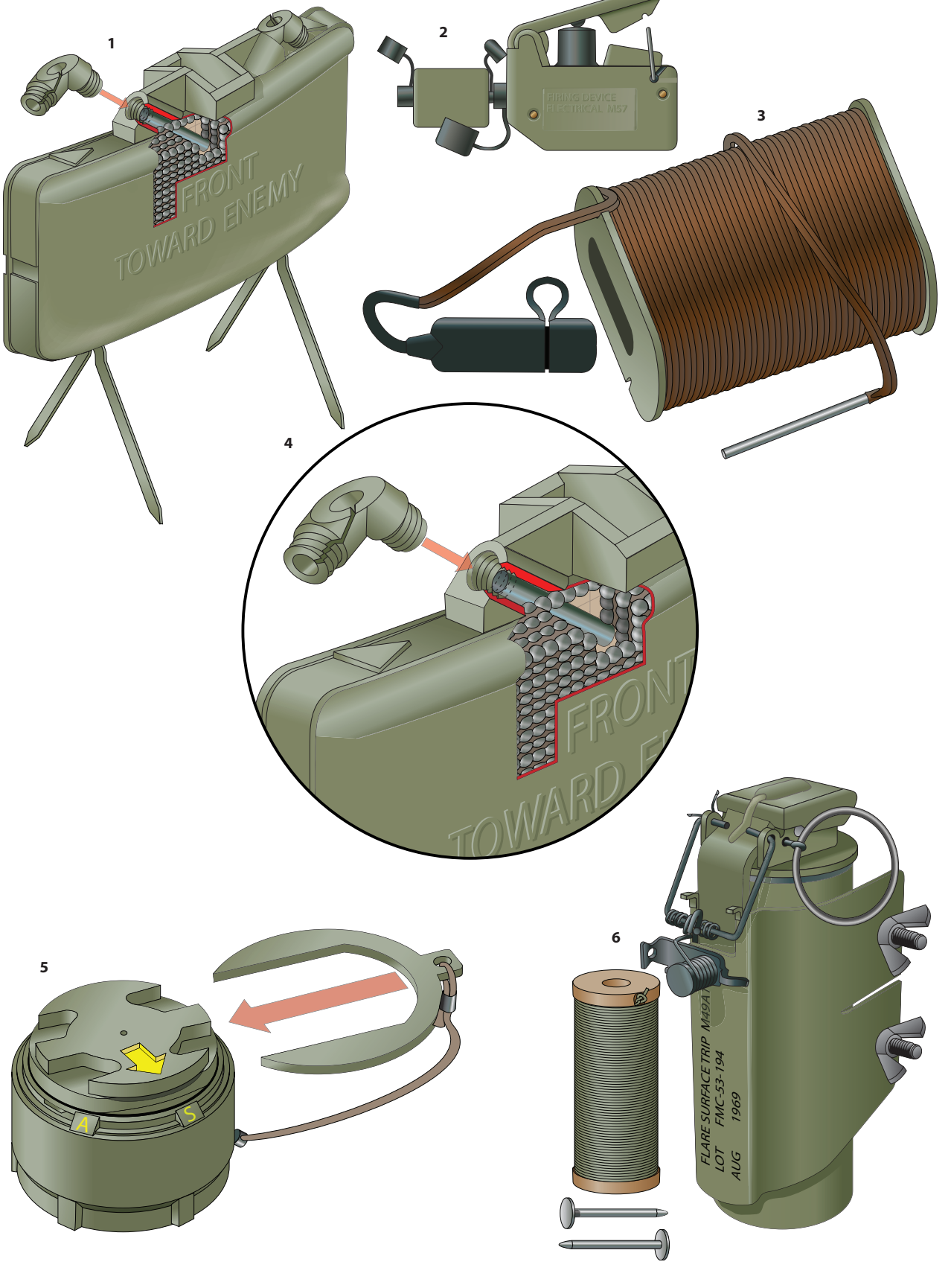
Set to cover a kill zone, Claymores would be command-detonated. The blasting cap was inserted in one of the detonator wells; the firing wire was anchored to a stake or tree to prevent the mine from being pulled over if someone tripped on the firing wire. The wire was run back to protecting cover at least 16m (52ft) to the rear. When detonated it would blast the ball bearings outward in a 60-degree fan that was lethally effective to 50m (55yd), moderately effective to 100m (109yd), and dangerous to 250m (273yd). Secondary fragmentation was dangerous up to 100m (109yd) to the sides and rear, meaning that friendly personnel within 100m had to be in protected positions. Placing the Claymore's back against a tree or rock would direct more blast into the kill zone and protect friendlies to the rear, though they have been known to topple supporting trees.

**H** **FREE WORLD BOOBY-TRAP DEVICES**

The M18A1 Claymore antipersonnel mine (**1**) is shown here with its accessories: M57 firing device, or "clacker" with M40 circuit tester attached (**2**), and spool for 100ft electrical firing wire with M4 blasting cap (**3**). (The M7 two-pocket bandoleer is not shown.) The cutaway portion (**4**) reveals the ball bearings embedded in an epoxy matrix and one of the two fuze-well tubes. Besides the issue electrical firing wire, detonating cord with a blasting cap, time-delay fuze, or mechanical firing devices (pull, pull-release, pressure, and pressure-release) could be fitted in a fuze well.

The M14 "toe-popper" antipersonnel mine (**5**) was virtually all-plastic. While very small, it was an effective harassing device if planted with consideration of enemy movement patterns. This mine's safety clip is removed, but the rotating pressure plate is still set on Safe. Rotating it clockwise to "A" for Armed fully armed the mine. The pressure-activated fuze was integrated into the mine and did not need to be inserted into the mine to use it.

The M49A1 surface trip flare (**6**) is shown here with the mounting bracket reversed for mounting on a stake. As packaged, the bracket was reversed. Shown here are the two wingnut bolts, the arming pin and ring, the "rectangular" safety pin (removed when arming), and the spring-loaded trigger to which the tripwire(s) were attached. A 40ft OD tripwire spool and two nails were issued with each flare.


1
FRONT
TOWARD ENEMY
2
FIRING DEVICE
ELECTRICAL M57
3
4
FRONT
5
A
S
6
FLARE SURFACE TRIP M49A1
LOT FMC-53-194
AUG 1969

For ambushes, multiple Claymores were set along the route with overlapping coverage and 5–45m (16–148ft) between mines – 25m (82ft) being optimal – with 16–20-plus pellets hitting a man. The mines needed to be 20–30m (66–98ft) from the kill zone for the most effective overlap. The mines could all be connected by lengths of detcord, with detonators on both ends running from the second detonator well to the next mine and so on – "daisy-chaining." The firing wire and detonator were inserted in one mine and when it was fired all the connected mines detonated instantly.

Another method was the automatic ambush or "mousetrap." The mines were linked in the same manner with detcord as rigged for command-detonation, but a tripwire crossing the route could be rigged with a pull-type firing device and connected by detcord to one of the mines' second detonating well. Tripping the tripwire would set off all the mines.

For perimeter defense, Claymores were sited around installations within their wire barriers – they had to be a safe distance from the perimeter fighting positions. They may have been individually positioned, set up in lines with multiple mines – usually three or four, several meters apart, each fired by its own clacker or "daisy-chain" connected by detcord so the mines would detonate simultaneously. Individual mines were set in the wire to be detonated by infiltrators triggering tripwires. They were placed well inside the wire to make it difficult for sappers to disarm them. Mines in the wire were usually tamped with sandbags placed on top and around the sides and back to protect them from the weather and prevent secondary fragmentation being blown to the rear. Perimeter defense Claymores were frequently inspected and circuits tested.

There were instances of Claymores within the barrier wire being neutralized by infiltrating sappers. To prevent this, the mines' backs were painted white, which sentries could see in starlight or moonlight. Detecting tampering, sentries immediately detonated it. Other anti-tampering methods included wrapping mines with barbed wire and binding them to two short pickets, attaching grenades or trip flares to mines with pull-wires to activate them, and digging 1ft-square holes several inches deep, each with a mine set in it and concrete poured in to anchor the legs.

Reconnaissance teams being pursued by the enemy left tripwire-activated "automatic ambush" Claymores as a determent. Reconnaissance teams pre-assembled Claymores for this purpose to allow rapid emplacement. It still required significant time to emplace them properly – five minutes or so. Time was of the essence. Whether equipped with stay-behind Claymores or not, the team strove to maintain as much distance between themselves and their pursuers as possible. To be effective, the mine and tripwires had to be well concealed and this consumed additional time. Prior approval had to be granted for the use of this method and its location had to be recorded accurately – although there was little chance of this in reality. A delay of 60–120 seconds (18–36in of time fuse) was typical. A second Claymore or grenade with a fuse at least 60 seconds longer might be concealed nearby. This delayed the enemy further and inflicted casualties on those exposing themselves to aid the first Claymore's casualties. Even if stay-behind mines were discovered, their discovery slowed the enemy.

Claymores were often emplaced to protect a reconnaissance team's overnight hide sites and recovered when the team displaced. This might involve 2–8 command-detonated Claymores, positioned depending on the enemy threat (intense and active pursuit), terrain, and vegetation density.

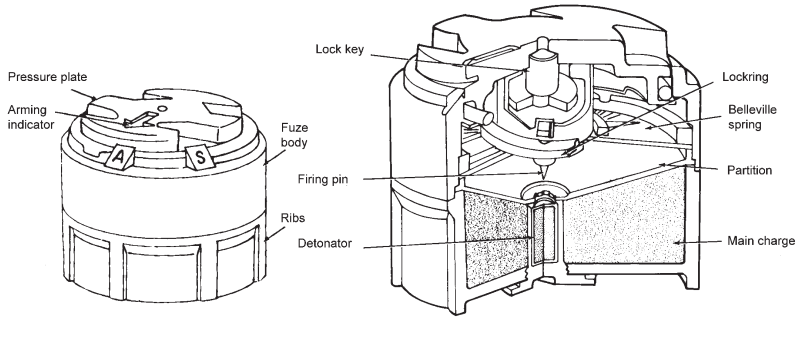
The team needed to be at least 16m (52ft) from the mines and behind trees. If the enemy discovered the site and attacked or were unknowingly about to walk into it, *all* the mines were blown (so the enemy could not recover undetonated ones) and the team immediately withdrew, taking evasive action. The enemy would be stunned, disoriented, and blinded. Grenades were not generally thrown when withdrawing as they could strike vegetation, causing the grenades to detonate too close to friendlies.

A potentially fatal mindset was discovered when Claymores were used to defend reconnaissance-team hide sites. When an enemy force was discovered closing in on the site, the team should have withdrawn immediately to avoid decisive engagement with a superior force. Instead, teams sometimes remained in place to engage the enemy with the mines. While casualties would be inflicted on the enemy, an experienced enemy would immediately outflank and box-in the team. It was better to withdraw without engaging the enemy, even if the mines were abandoned (they probably would not be discovered by the enemy). The firing devices would be taken, however. The Claymores were emplaced to defend small team sites *only* if surprised and no other recourse was available.

Most ambushes executed by the author's Civilian Irregular Defense Group company were on 2–3-man "trail-watch teams" which looked for evidence of the enemy's presence, trail washouts, fallen trees, cleaned-out way-stations, etc. A Claymore would be emplaced 30ft from the trail for fire from the flank. Two more would be emplaced about 10ft up and down the trail on either side of the first mine. They were "daisy-chained" with detcord to the first mine and the two mines angled to fire up and down the trail. Two more mines were set maybe 50ft up and down the trail, and also angled to fire up and down the trail. There was no way of knowing from which direction the VC would approach. A pull-activated firing device was attached to these two mines with a 40ft tripwire that was not stretched across the trail. The strikers who emplaced them were hidden well back from the trail. When an enemy team walked into the kill zone the first Claymore was detonated by its electrical firing wire, setting off the mines to either side. The first mine wiped out the team and the mines firing up and down the trail took out anyone following or lagging behind a larger group. As the bodies were searched and weapons collected the two men with the farther-away mines quickly strung the tripwires across the trail. These were left in place when the author's company withdrew to catch a reaction force that was rushing to the ambush site and unlikely to look for tripwires. On two occasions detonations were heard.

## US antipersonnel mines

Two models of buried antipersonnel mines were used by the US, the M14 and the M16 series. The tiny **M14 antipersonnel mine** was made entirely of plastic with only the firing pin and primer being metal. Even the firing spring was plastic. Weighing 3.8oz with 1oz of Tetryl, it incorporated a




These diagrams show the diminutive M14 antipersonnel mine. The mine shown here has been armed, as the arming indicator is set to "A." (US Army/ Wikimedia/Public Domain)

small shaped charge that mangled a foot. Being made of plastic, 1.57in high and 2.20in in diameter, it was extremely difficult to detect. To emplace it a small hole was dug, the base plug removed, and the detonator screwed in. Set in the hole with the top at ground-level, the pressure plate was rotated from Safe to Armed, and the safety clip pulled out by a cord. Armed, it was lightly covered with dirt, leaves, and grass. They were seldom emplaced within firebase wire barriers as they were so difficult to locate and remove making it unsafe for wire, Claymore, and booby trap maintenance and brush-clearing details. Its most frequent use was by reconnaissance teams, mainly on the Ho Chi Minh Trail and other infiltration routes. Typically, four M14s would be buried on a trail in a diamond pattern a couple of feet apart. A passing man would invariably tread on one. Those rushing to aid the casualty might detonate other mines.

**M16-series antipersonnel mines** saw little use in wire entanglements, being difficult to emplace and recover. The mine's can-like body weighed 8lb and was 5in high without the fuze and 4.02in in diameter. Several types of fuzes could be fitted including booby trap firing devices. The most common was the M605 combination fuze. This fuze assembly projected about 2.5in from the top from the M16A1's center; the M16A2 was offset. There were three pressure prongs on top that detonated if disturbed. On the fuze's side was a pressure pin release ring to which up to 10m (33ft) of tripwire could be attached and run in two directions. A bounding-type mine, when the M16 was activated there was a fraction of a second delay and 1.15lb TNT charge in a cast-iron casing was fired to 1–5.5ft and detonated with a casualty radius of 27m (89ft) (M16A1) or 30m (98ft) (M16A2).

During 1968–69, 200 **XM54 "pop-up flame mines"** were field tested in Vietnam. The bounding-type mine ejected a 15.3lb WP charge which traveled 3–11m (10–36ft) before detonating. It showered an area with a radius of 25m (82ft) with burning WP particles; about the same capacity as a 155mm WP projectile. The 30lb mine could be tripwire-activated by its M605 fuze, command-detonated, or booby-trapped. Its necessity was poorly considered as it was too heavy to carry on ambush patrols and the difficulty of disarming and recovering it when withdrawing from an uninitiated ambush. It could not be used for perimeter defense because of its 100m (109yd) safety radius, and the dense smoke cloud it created screened the attacking enemy making it unacceptable in either role. Some were emplaced in Katum Special Forces Camp's wire. Nicknamed "Kaboom," the camp was frequently attacked/probed in 1967–69, but no WP mines were activated.

Very limited use was made of World War II-era obsolete M2 and M3 antipersonnel mines and few, if any, antitank mines were used. The VC used small numbers of captured US mines. The Chinese made an exact copy (Type 4) of the US M1 antitank mine, even painted in US colors and markings. These saw some use by the VC/PAVN.

# CONCLUSION

Free World forces in Vietnam and to some extent in other Southeast Asian countries were subjected to booby traps and mines on a scale never before experienced. The enemy was creative, determined, and ingenious. The fact that they were largely fabricated from natural, commercial, and non-

military materials made it all the more difficult to neutralize the seemingly endless numbers of creatively designed devices. Besides, new and unfamiliar devices were constantly being encountered and the typically excellent camouflage made detection and neutralization all the more difficult. Their value went beyond inflicting fatalities, wounds, and material damage. Booby traps had a significant impact on morale.

A member of the 26th Marines carefully probes and digs out a small unidentified antipersonnel mine using a Ka-Bar fighting knife. The possibly "homemade" mine itself may be booby-trapped. (US Marine Corps/Wikimedia/CC BY 2.0)

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# INDEX

References to illustrations are shown in **bold.** Plates are shown with page locators in brackets.


ambushes 9, 55, 60, 61
angled arrow traps 11–12, **11**, **A2** (13)
anti-helicopter grenade launchers **D2** (33), 34
armored assault vehicles **23**
armored personnel carriers **23**
artillery, bomb, and mortar round traps 23, **26**, **32**, 36–37

balls *see* spikes: spiked logs and balls
bamboo 7, 8, **A** (13)
bamboo arches 28, **C1** (31)
bamboo whips 11, **A1** (13)
banner traps *see* flag and banner traps
barbed-wire barrier traps 55–57, **56**
barbed-wire squares 56
base camps **E** (41)
bazooka rocket traps 35
bear traps **11**, 12, **E13** (41)
bicycle mines 32
blasting and detonation caps 22, 23–24, **B** (29), **H3** (59)
body traps 42
bomb traps *see* artillery, bomb, and mortar round traps
booby traps: overview of main types 6, 36; purpose 20, 36, 53
bridge traps **A6** (13), 14
broken branch traps 34
brush hooks **F11** (49)

cache traps 42
camouflage 40
cartridge traps 6, 32, **G12** (51)
casualties **20**, 53–54, **54**
cigarette-pack antipersonnel devices 35
Claymores **24**, **27**, **H1–4** (59): Free World force use 55, 56–57; overview 57–61; VC use 36, 40, **F3** (49)
clothing: body armor **45**; flak vests **5**; crow's feet 9

demolition charges 22–23
detection techniques 38–47, **45**, **46**
detonation caps *see* blasting and detonation caps
detonation cord 23–24
disarming 48–53, **52**
dogs 43–44
door traps *see* gate and door traps

emplacement: by Free World forces 55–62; by VC 4, 6, 36, 39–42, **E** (41), **F** (49), 53
EOD teams 52–53

firing devices 22, 25, 26, **B** (29), **32**
flag and banner traps 30–32, **38**, 41, **F5** (51)
fuel-tank traps 32–34, **E12** (41)
fuzes 23, **44**

gate and door traps 28–30, **C2–3** (31), **G3** (51), **G8–9** (51)
grapnels **F10** (49)
grave traps 42
grenade can traps **19**, **21**, 27
grenade pressure releases 27–28, **G6** (51)
grenades
  anti-helicopter grenade launchers **D2** (33), 34
  color codes and markings 24–26
  crudely manufactured **35**, **52**
  Free World force use 55, 56
  overview 17–21
  PAVN **22**
  prevalence of use 36
  types: DF M1937 21; F-1 **19**, 21; M26 **18**, 19–20, 21, **21**, **22**, **B5** (29); M33 20; M56 19; M57 19; M61 19; M67 20, 21; Mk 2A1 19, 21; OF M1937 21; RGD-5 21; Type 67 stick **19**, 21, **52**
  use in booby traps **22**, 27–34, **30**, **38**, **E** (41)

helicopters
  anti-helicopter grenade launchers **D2** (33), 34
  can traps **D3** (33), 34
hooches *see* villages

informants 42

Kit Carson Scouts (KCs) 42
knives **63**

LAWs, in booby traps 35
logs *see* spikes: spiked logs and balls

maces 16, **E1** (41)
manufacture *see* sources and manufacture
markers 39, **39**, 43
mines
  behavior once triggered 25
  clearing 47–48, **F** (49)
  detecting 43, 45–47, **45**, **63**
  Free World force use 55–62
  overview 22–32
  pop-up flame mines 62
  S-mines 25
  types 6, **24**, **27**
  US antipersonnel mines 61–62, **61**
  *see also* Claymores
moats 56
mortar round traps *see* artillery, bomb, and mortar round traps

Operation *Double Eagle* (1966) **1**

paracord 27
"people-sniffers" **46**
People's Army of Vietnam (PAVN) 6
pit traps
  other pits 12–14, **12**, **A** (13)
  punji pits 7–8, **8**, **9**, **10**, **E2** (41), **G7** (51)
pivoted spike boards 12, **A3** (13), **16**, **G11** (51)
punji stakes **7**: emplacement 7; manufacture 6, 9; origins 7; in other traps 11, 14; overview 7–9; punji fields **1**, **5**, **37**; punji pits 7–8, **8**, **9**, **10**, **E2** (41), **G7** (51); *see also* spikes

rattle traps **56**, 57
road clearing 47–48, **F** (49)
roadblocks 40, 47–48, **F7–8** (49)
roof grenades 32, **38**, **E9** (41), **G10** (51)

sideways-closing traps 12–14, **A5** (13)
sources and manufacture 4–6, 24
Special Attack Corps 37–38
spikes: in other traps 12, **12**, **A** (13), **14**; pivoted spike boards 12, **A3** (13), **16**, **G11** (51); spike plates 10–11, **E6** (41), **G13** (51); spiked logs and balls 16, **E1** (41); suspended spikes device **A7** (13), **15**, 16
stream traps 42; *see also* bridge traps
sunglasses 43
suspended spikes device **A7** (13), **15**, 16

tactics 4, 20, 36, 53
tanglefoot low-wire entanglements 55–56
tank traps 28, **D1** (33)
termite mounds **42**
toe-poppers 36–37, **H5** (59)
training 45, **45**
trap bridges **A6** (13), 14
trash dump traps 42
tree-mounted traps **C4** (31), 32
trip flares 56, **56**, 57, **H6** (59)
tripwires 27, 28, 43
tunnel complexes 42, **42**

Venus flytraps 12, **12**, **A4** (13), **14**
villages **F9** (49), **G** (51)
Volunteer Informant Program (VIP) 42

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## Abbreviations

| | |
|---|---|
| APC | armored personnel carrier |
| ARVN | Army of the Republic of Vietnam |
| C-4 | plastic explosive |
| ChiCom | Chinese Communist |
| CIDG | Civilian Irregular Defense Group |
| ComBloc | Communist Bloc* |
| Comp B | Composition B (HE) |
| CS | orthochlorobenzalmalononitrile ("tear gas") |
| detcord | detonating cord |
| EOD | Explosive Ordnance Disposal |
| HE | high-explosive |
| LAW | light antitank weapon (M72) |
| LZ | landing zone |
| OD | olive-drab |
| PAVN | People's Army of Vietnam |
| PETN | pentaerythrite petranitrate |
| TNT | trinitrotoluene (HE) |
| US | United States |
| UZRGM | Universal'nvi Zapal, Rushnaya Granata, Modernizirovannyi ("Universal Igniter, Hand Grenade, Improved") |
| VC | Viet Cong |
| WP | white phosphorus smoke ("Willie Peter") |

* ComBloc includes the USSR, Communist China, North Korea, and the six Warsaw Pact states.

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## Safety

Booby traps are designed to inflict casualties and/or cause material damage. This can apply to the maker, installer, and innocent bystander as well as intended victims. The setting up, arming, and manufacture of booby-trap components, especially explosives and detonators, can be extremely dangerous. This book is not meant to be a "how to" manual. The information provided is intended only for historical study. Readers are implored not to attempt to manufacture or employ any form of booby trap or their components. The devices described in this book are fabricated mostly from standard military-issue munitions and accessories, which are seldom available today. The VC manufactured numerous components and devices using crude methods and poor-quality nondurable materials. They also modified Free World munitions using simplistic techniques. These altered devices were dangerous to manufacture, modify, handle, and employ. Disarming crude and field-modified devices was doubly dangerous.

Laws of course vary greatly between countries, but for the most part national and local laws prohibit the use of explosives and infernal devices, that is, *any* form of unattended device which may cause harm to a person or property whether that person has legally or illegally entered the property on which the device is located. The manufacture of booby traps, whether explosive or non-explosive (such as punji stakes), can lead to a charge of criminal possession of a weapon or a destructive device. It makes no difference if property is being protected from intruders. In light of today's virtually unrestrained liability suits, it would be foolish for a person to construct any form of booby trap, leaving aside its intent or the degree of injury it might inflict.

Also, the much-heightened security measures since 9/11 have created an environment in which any form of suspicious devices and materials, including replicated inert and simulated devices, can get a person in serious trouble. This includes simulated devices used by re-enactors. Use good judgment with making, transporting, and employing such devices. Simulated or replicated devices should be marked "Inert" or "Dummy." Reenactment/demonstration booby traps must be marked and protected to prevent injury to spectators and visitors, e.g. a fixed grating covering a punji stake pit. Anything that even remotely looks like an ordnance device will invoke a strong response by authorities. If confronted by authorities immediately declare such devices.

Any forms of explosive devices were prohibited from being brought home as war trophies. In Vietnam, this applied to any type of ammunition, punji stakes, and Montagnard crossbow bolts (arrows) for fear of poison tips. In some instances, inert hand grenades were permitted, but the explosive filler, igniting cap, delay fuze train, and detonator had to be removed by EOD (Explosive Ordnance Disposal) and certified.

*Never under any circumstances attempt to modify or tamper with any component of any type of live ordnance device.*

**TITLE PAGE IMAGE:** Troops of 2d Battalion, 4th Marines pass punji stakes during Operation *Double Eagle*, January 1966. (DEFENSE DEPT PHOTO (MARINE CORPS) A186576/Wikimedia/Public Domain)